2015

The Definition and Determination of Death

Brittney Jean Palermo
University of Vermont, bpalermo@uvm.edu

The Definition and Determination of Death

Brittney Palermo
Arts & Sciences Undergraduate Honors Thesis
April 28th, 2015

Table of Contents:

Introduction:

At one time it seemed easy to determine when a human being had died. Moreover, it was not especially important to determine death with any precision, because there were no questions about when life-supporting measures could be suspended, since mechanical "life-support" did not yet exist, and because there was no time-sensitive use for a dead body, since the practice of organ transplantation had not yet been introduced. Recent advances in medicine (e.g., the advent of machines for sustaining respiratory and other critical functions, and the introduction of organ transplantation as a method of treatment, both in the 1950s) have made it crucial to determine time of death with precision. Advances in mechanical support have also made it difficult to answer the question of what is to count as someone's death, because these life-supports might possibly sustain some of the functioning of a dead body. A universally accepted definition of death has yet to be found. The widely acknowledged and legally determined criterion for the death of a human being in the United States is currently the irreversible cessation of functioning of the critical structures of the whole-brain. This "whole-brain criterion" has come into question, concerning both whether it correctly identifies when death has occurred, and whether it is the best criterion for practical public application. In the project to follow, I will work to clarify the issues surrounding the question of how we are to understand what death is and the further question of how best to determine whether death, so understood, has actually occurred. I will conclude that the death of a human being is fundamentally biological, and predicated of the loss of the somatic integration of the organism as a whole, rightly determined to have occurred by use of the circulatory-respiratory criterion (the irreversible cessation of circulatory and respiratory function). Finally, I will explore different views about how various understandings of what death is should be incorporated into public policy. I will consider the extreme need for procurable

organs and the scarcity of medical resources, and will propose that policy recognize the "higher-brain criterion" (the irreversible cessation of functioning of the critical structures of the higher-brain) as a way to determine when we may permissibly do certain things to a human being (like procure organs and remove treatment) that might not historically have been thought to be appropriate or acceptable before a determination of death.

In order to understand the arguments to be presented, one must first understand the biological structures that play major roles in the discussion of each: the brain, the heart, and the lungs. The brain has 3 general structural divisions: the cerebrum, the cerebellum, and the brainstem. The cerebrum functions as the primary controller of consciousness, thought, memory and feeling. The cerebellum is responsible for motor control and coordination. The brainstem controls spontaneous and homeostatic functioning like sleep-wake cycles and spontaneous respiration. The brainstem also includes the ascending reticular formation, which is essential for conscious awareness to take place (it is a sort of on-off switch that controls whether or not a human being can be conscious).

Respiration is controlled by a part of the brainstem called the medulla, which sends neural impulses to stimulate the diaphragm and the muscles of the chest wall, causing a negative pressure which allows the lungs to fill with air. The medulla works to maintain carbon dioxide and oxygen levels in the body by adjusting the rate of breathing so as to keep them in balance. Brain structures work together to maintain homeostasis of the human being. For example, sometimes other areas of the brain (cerebrum) may briefly take over control of respiration, but only in certain circumstances that require it (heavy exercise, coughing, sneezing). When a body is unable to perform respiration (often due to injury or failure of the brainstem), the heart is deprived of oxygen and it ceases to beat (stopping circulation as well). Brain function,

respiration and heart function are interdependent in this way. When mechanical ventilation is used, it allows for the continuation of lung-function and heartbeat, even without the medulla's regulation. Patients without brain function would have been declared dead before this technology was possible (because the respiratory and circulatory functions would have necessarily ceased simultaneously with or quickly after brain death). But with mechanical ventilation the line between life and death does not appear to be as cut-and-dried. Should these patients still be considered to be dead because of the loss of brain function, or should they be considered to be alive because of the continued respiratory and circulatory functions? This question prompts a major bio-philosophical investigation into the nature of death.

The ongoing debate over the determination of death is characterized by the definition-criterion-tests model. This model allows theorists to split the question "What is death?" into three distinct parts, each building on the last. The initial step in any analysis of death is to establish a *definition*, or at least a clear understanding of what "death" is. The definition of death must say what death *is*, which may include the loss of certain physiological and/or psychological aspects of human life.

Next, a *criterion* or set of criteria for death for applying the definition must be determined. The criterion is used to ensure that the definition of death has been met. It is some physiological condition or set of conditions that fully satisfies the definition's requirements and is testable.

Finally, the diagnostic *tests* for determining that the criterion has been fulfilled must be outlined for real-world application. This is primarily a medical and not a philosophical task. This thesis will focus primarily on arguments regarding definitions and criteria and will not complete a full investigation into the scientific tests to be used to prove that the criterion or criteria have

been met. We should instead leave this task to medical professionals who will best understand how to test whether a physiological criterion has been met.

In this thesis, I will consider the arguments for and against the currently accepted definition of death and the whole-brain criterion, and also two proposed alternative approaches, namely the circulatory-respiratory criterion, and the higher-brain criterion.

The *whole-brain* approach is so named for its criterion: the irreversible cessation of functioning of the critical structures of the whole-brain, including the cerebrum, the cerebellum and the brainstem. Whole-brain theorists argue that the whole-brain criterion ensures that the definition of death has been met. These theorists define death as the irreversible cessation of the integrated functioning of the organism as a whole, and claim that this definition is conceptually coherent in its basic principles (President's Commission 1981 (33), Bernat 2006 (38)). In addition, there are those theorists who do not consider this definition of death to exactly capture what we mean when we talk about "death," but who nevertheless argue for the practical application of the whole-brain criterion (Chiong 1989 (2205)).

The *circulatory-respiratory* approach accepts the same definition that is used by the whole-brain theorists (the irreversible cessation of the integrated functioning of the organism as a whole), but circulatory-respiratory theorists maintain that the brain is not the supreme integrator of the organism in the way that whole-brain theorists have made it out to be (Shewmon 2001 (457)). Circulatory-respiratory theorists (also called *somaticists* for their emphasis on somatic functioning) recognize the importance of the brain in playing a supportive role in maintaining life and the integrative functioning of an organism, but insist that the loss of brain function does not mean that the organism has lost all of the somatic integrative unity necessary for biological life. The somaticists argue that the circulatory-respiratory criterion (the complete and irreversible

cessation of circulatory and respiratory functioning) fully ensures that this definition of death has been met.

The *higher-brain* approach is the last of the three most prominent theories. Higher-brain theorists put more emphasis on the importance of the capacity for consciousness, though not all think that possession of this capacity is both necessary and sufficient for life (Veatch 2005 (368)). These theorists claim that the line between life and death depends as much or more on one's capacity for conscious awareness (even minimally) as it does on the integration of the "organism as a whole" (somatic integration, the irreversible loss of which is identified by whole-brain and circulatory-respiratory theorists as the definition of death). Veatch argues that these other theorists have given a mistaken definition of death, and instead proposes that death be defined as the irreversible loss of the integration of body and mind (with "mind" being the capacity for conscious thought, not the physical structures of the brain). Higher-brain theorists argue that the higher-brain criterion (the irreversible cessation of the functioning of the higher brain, including the cerebrum and the cerebellum) ensures that their proposed definition has been met.

The definition of death and the practical determination of when that definition has been met have serious implications for organ procurement policies. Viable transplantable organs are not in sufficient supply. It is possible that policy-makers have embraced the whole-brain criterion for death because it makes it possible to harvest donor organs sooner (and in more viable condition) than the more traditional circulatory-respiratory criterion. One concern is that our society be able to address this grave need for procurable organs while remaining respectful of the essential nature of death. It is important that our understanding of what death is not be distorted by the understandable need for more viable donor organs. Thus it is inappropriate for any

formulation of death to be accepted primarily for the sake of facilitating organ procurement. This analysis of death must first offer us clarity about what death is.

I will begin in Chapter 1 with an analysis of the currently accepted public policy: the whole-brain criterion. This chapter will look at the original proposal of the whole-brain criterion for death made by the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research in "Defining Death: A Report on the Medical, Legal and Ethical Issues in the Determination of Death" (1981) and how it has been argued for further by James Bernat in "The Whole-Brain Concept of Death Remains Optimum Public Policy" (2006). This chapter will also detail the argument made by Winston Chiong in "Brain Death without Definitions" (1989) against the President's Commission's definition of death, but in support of the whole-brain criterion for public policy.

Chapter 2 will be an analysis of the arguments for the circulatory-respiratory criterion. It will look at a piece by leading circulatory-respiratory theorist Alan Shewmon, "The Brain and Somatic Integration: Insights Into the Standard Biological Rationale for Equating 'Brain Death' With Death" (2001). This chapter details Shewmon's arguments against the whole-brain criterion and for the circulatory-respiratory criterion as the best criterion for death.

Chapter 3 will discuss the arguments made by Robert M. Veatch in "The Death of Whole-Brain Death: The Plague of the Disaggregators, Somaticists, and Mentalists" (2005). Veatch argues against the definitions and criteria proposed by whole-brain, circulatory-respiratory, and other alternate theories of death. He instead proposes that the higher-brain criterion is best for ensuring that the definition of death (as he puts forth) has been met.

Following an in-depth study into the whole-brain, circulatory-respiratory and higher-brain definitions and criteria for death, Chapter 4 will consider the implications of each for

public policy and especially for organ procurement. Finally, a recommendation for public policy that will be both philosophically sound and practically applicable will be put forth. Such a recommendation has only been made after a careful study of the balance of reasons for and against each considered formulation of death. My ultimate proposal will be that the circulatory-respiratory criterion best identifies when death has occurred, but that we may permissibly do some things like procure organs and withdraw treatment from human beings who meet the higher-brain criterion. I will conclude, however, that the whole-brain criterion is the best criterion for public policy *at this time* due to the likely reluctance of the public to accept my proposed two-pronged policy.

Our discussion about the definition and determination of death will begin with an investigation into the whole-brain formulation in Chapter 1.

Chapter 1: Whole-Brain Criterion

The whole-brain criterion for determining that death has occurred requires the irreversible cessation of functioning of the whole-brain (which includes the cerebrum, the cerebellum and the brainstem). This criterion is currently accepted for the determination of death in the United States. The decision to use the whole-brain criterion for public policy was made in response to a report by the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, titled "Defining Death: A Report on the Medical, Legal and Ethical Issues in the Determination of Death" in 1981 during the Ronald Reagan administration.

The President's Commission follows three steps for discovering how best to determine death. First, an analysis must establish a *definition* of death that accounts for what exactly we mean when we talk about death. Second, the definition must be distinguished from the *criterion* (or set of criteria) to be used to apply the definition in practice. This criterion will be a measurable condition that is both necessary and sufficient for death as so understood to have occurred. And third, the types of diagnostic *tests* necessary to demonstrate (with high accuracy) that these criteria have been fulfilled must be established. This definition-criteria-tests model for the analysis of death has been adopted by many theorists, including a leader in the whole-brain camp, James L. Bernat, in his article "The Whole-Brain Concept of Death Remains Optimum Public Policy" (36).

The President's Commission laid out much of the argument for whole-brain death in 1981. Since then, whole-brain theorists have done a lot of work to expand their arguments, and to propose further proofs for the validity of the whole-brain criterion for the determination of death. James L. Bernat may be the most successful of these theorists. In what is to follow, I will

discuss the arguments for the whole-brain criterion as put forth by the President's Commission and expanded by Bernat. I will then discuss an alternative argument for the whole-brain criterion proposed by Winston Chiong. Chiong argues that the whole-brain criterion is the best criterion for public policy and should be implemented as such despite its failure to fully account for the right definition of death.

To begin his analysis of death, Bernat puts forth a "paradigm of death," a set of conditions that he believes will help to tease out the nature of death. Through this paradigm he means to clarify what it is that we mean when we talk about death, so that he may propose a formal definition of death, upon which he will build his theory (using the definition-criterion-tests model). His idea is that apparent disagreement about the correct criterion for death may not actually be about the criterion, but may actually be disagreement about what definition we are using for "death" (Bernat 36). He suggests that our discussion about death is confused because there is not a consensus about the definition.

Bernat's paradigm comprises seven parts. He believes that these seven elements encompass what we think to be true about the nature of death. First, he wishes to clarify that when we are discussing "death" in this context, we are analyzing the common use of the word, which we all use to correctly refer to the end of life (Bernat 36). Bernat wants to make clear the meaning of this term, not to contrive a new meaning of "death."

Second, Bernat wants to look at death as fundamentally biological. He does not want to take away from the important cultural and religious practices surrounding death, but he does want to make clear that the event of death should be analyzed as a biological phenomenon. He thinks that whether or not death has occurred is fundamentally an objective biological fact, and our analysis should treat it as such (Bernat 36-38).

Is he right to look at death only as a biological occurrence? There are certainly many other factors at play when we think and talk about death. For many, the organismic body is only part of what is essential for the life of a human being. It would not be unreasonable to assert (as many higher-brain theorists do) that the organism, the *something*, is distinct from the individual who inhabits, or owns, or is causally linked with it—the *someone*, who has the capacity for self-awareness, for consciousness and/or the ability to experience the world. The important components of the life of a human being may be more than the functioning of the human organism.

Bernat would say that it really is the biological body that dies, and this is evidenced by how we apply the word. For example, someone might experience a traumatic injury and loose the capacity for much or any cognition. We might say that such a person is in a very grave or dire condition, but we would not say that she is dead. Are we right to say so? Bernat would say yes, but perhaps the very fact that the long-standing legal criterion for death is biological has influenced our beliefs about death. The higher-brain theorist will try to argue against this notion that the death of the body is the death of the human being.

Third, Bernat thinks that an analysis of death should be restricted to that of higher vertebrate species. We mean the same type of death when we say that a human died as we do when we say that a dog died. Cells, tissues and microorganisms die, but this type of death is not what we are interested in discussing (Bernat 37). In proposing this element of the paradigm, Bernat is trying to simplify our discussion about death by not including physiological factors unrelated to the central issue. In particular, he is only trying to examine the death of organisms with brains. It is unclear why Bernat only wants to include higher-vertebrate species as opposed to any living creature with some type of brain (primitive or not). Further, it seems unreasonable

for Bernat to throw out any living thing in this paradigm of death. It seems like we talk about the death of a human being in the same way that we talk about the death of any biological entity (even though we might not attribute the same value to all types of life). For example, when we think that a bacterium has died, we don't think it has died with regard to some concept of death that is different from the one we apply to ourselves. The loss of biological life appears to be similar among all biological entities. If Bernat formulates a definition of death that is only applicable to higher-vertebrate species, his definition will fail to encompass all that we mean by "death". Perhaps his intent with this assertion is relevant to the "criterion" rather than the "definition". In his analysis Bernat is looking for a criterion for death that is applicable to higher vertebrates like human beings, which will be right as long as his underlying definition applies to all living beings.

Fourth, we are applying "death" in this analysis to only living organisms. This term may be applicable to non-living things, for instance we might talk about the death of a culture, but Bernat does not wish to discuss this usage of the word. It could be that "death" can be literally applied in this way and that the "death" of something is just the irreversible absence of whatever made that something what it (essentially) was. A discussion of this usage of the word "death" is not specific enough for Bernat's purposes, since he is looking specifically at the death of living beings. When we talk about the death of a person, what we specifically mean, says Bernat, is the death of the biological organism (Bernat 37).

Fifth, life and death are mutually exclusive and jointly exhaustive, an organism may be either alive or dead, and must be in one but never both of these states. Bernat argues against the theory of "fuzzy sets" (that the world is not easily divided into sets and their complements) being applied to death. According to the application of the fuzzy sets theory to "death", an organism

may reside in some indeterminate state. Because it seems like no one can be both living and dead, or neither living nor dead, and it makes sense that this would be true, there's no reason to posit the idea of fuzzy sets in the case of death. What might be said to be fuzzy actually seems to Bernat to be the presentation of the dying process (he thinks that apparent indeterminate states around death are merely late stages of dying, when a human being is living, but is in the process of coming to be dead). Bernat argues that death is not itself fuzzy (Bernat 37). Bernat is unclear as to how he arrives at this conclusion. He denies that it is plausible for an organism to reside in some indeterminate state, but he fails to offer a proof of this. It's not inconceivable that an organism might go through a transitional state between life and death when he is both a little bit living and a little bit dead, or that an organism could (in theory) go through a sort of suspended state that is neither living nor dead (a once living organism might cease to function in any way for some time and then be re-animated). The possibility of such a suspended state is tied in with cryonics, a theoretical method by which a patient with an incurable illness might be frozen, and then thawed at some time in the future when treatment for the illness is possible.

The sixth part of Bernat's paradigm says that death is a single instantaneous event, not a process. It is only because we are not always technically able to determine an exact moment of death that we may think of death as a process, but Bernat wants to say that death is really a single event at which time an organism transitions from being alive to being dead (which are mutually exclusive) (Bernat 37). This follows from the fifth premise of the paradigm, and so relies on there being no indeterminate state between life and death. It's possible that Bernat is right, and the view of death as a process is just due to an epistemic difficulty, but it's also possible that there is an indeterminate state between life and death, and the epistemic difficulty lies in detecting that state. Bernat hasn't shown that death is necessarily an instantaneous event.

Lastly, Bernat claims that death is by nature irreversible. We cannot bring someone back from the dead, any technological intervention only allows for the interruption and reversal of a late stage of the dying process (Bernat 37). In other words, Bernat is claiming that our concept of death necessitates that it be irreversible. But is this really what we think about death? It may not be physiologically possible to return a dead patient to life (at least with current medical technology), but it seems at least conceptually possible (at least some people have thought that it could happen—for example, Christians believe that Jesus really died and was resurrected). Bernat could say that he is not ruling out any non-physiological or miraculous ways that a human being could come back from being dead, but that he is just asserting that death is irreversible by only this-worldly, biomedical ways.

Bernat wants to use the paradigm he has put forth as a basis for determining the definition of death. Let's set aside any problems with the paradigm, and turn to an analysis of the whole-brain theorist's definition. Whole-brain advocates like the President's Commission want to define death as *the irreversible cessation of the integrated functioning of the organism as a whole* (President's Commission 33). These theorists are talking about integration as the organization of many constituent parts into a coordinated whole. They argue that this makes sense as a definition of death, as it is in line with our underlying concepts of death (as put forth in Bernat's paradigm). Whole-brain theorists insist that the life of an organism as a whole requires that complex integrative functions continue (like the integration of the brain, lungs and heart), and will later argue that the cessation of functioning of the whole-brain constitutes the loss of these integrative functions.

Bernat refines the whole-brain definition to be *the irreversible cessation of the critical functions of the organism as a whole* (Bernat 38). Bernat is trying to emphasize the importance

of critical functions, which he thinks work to maintain the organism as a whole, and thus indicate that integration is ongoing. Critical functions of the organism as a whole can be identified by their property of being emergent: the higher-level property resulting from the integration of some parts of the organism, not conferred upon the organism by any one part (and not reducible to any one part or set of parts). Critical functions of human beings would include consciousness and homeostatic functions of the body like circulation, respiration and temperature control. According to Bernat, these types of critical functions are essential to and indicate life of the human being. It is possible that the human organism could remain an integrated whole in the absence of some critical functions, but the loss of all critical functions constitutes total loss of integration, and thus death according to Bernat (38).

Whole-brain theorists maintain that a human organism cannot be regarded as alive if all systemic organization and stability of the living organism has ceased (even if cellular function of individual parts continues). The whole-brain formulation of the definition of death is addressed in most subsequent literature on this topic. Other arguments will: (a) accept this definition of death, (b) put forth a variation of this definition, or (c) deny this definition and put forth an entirely different concept for the definition of death.

Supposing that we accept the definition of death proposed by these theorists, we next need to find a criterion that fulfils the definition (in accordance with the definition-criterion-tests model). The criterion will be some condition or set of conditions that are necessary and sufficient for determining that the definition of death has been met. Whole-brain theorists claim that the irreversible cessation of functioning of all of the structures of the brain that are essential for integration (including the cerebrum, cerebellum and brainstem) is the best criterion for the death

of the human being (or more specifically, the organism as a whole), since it is both necessary and sufficient for meeting the definition.

According to the President's Commission, the brain, the lungs, and the heart assume special significance for life because all are crucial for survival and they are necessarily integrated with one another (President's Commission 33). They have identified the integration of this triad as that which is vitally important for life. The interdependent integration of these systems is evidenced by the fact that the permanent loss of functioning of any one of these organs directly (under normal circumstances and without medical intervention) leads to the loss of functioning of the other two, and thus the integrated functioning of the organism as a whole.

They argue that this criterion for death is not a departure from what we have always meant when we talk about death. It is just the case that circulation and respiration have been used as a criterion for death because they are easily measured, not because the loss of these functions has been shown to fulfil our definition of death. Instead, the whole-brain theorists claim that these "vital signs" are traditionally used to detect the integration among the interdependent systems of the body (the loss of circulation and respiration is a sure sign of the loss of life-sustaining integration).

The President's Commission reasons that the whole-brain criterion, as opposed to the higher-brain criterion and the circulatory-respiratory criterion, takes into account the importance of the interdependent integrated functioning of the brain, lungs and heart (President's Commission 33). The higher brain (cerebrum and cerebellum) is responsible for the mental life of a human being, and the brainstem is responsible for the functioning of the heart and lungs. The Commission makes the claim that the functions of both the higher-brain and the brainstem are together crucial for the integrated functioning of the organism as a whole, and that the

presence of either is sufficient for life. For them, it is only when all of these functions of the whole-brain are lost that death has occurred. The President's Commission claims that the irreversible cessation of functioning of the higher-brain and the brainstem together is both necessary and sufficient for determining that the definition for the death of the human being has been met (the loss of functioning of one of these structures is necessary but not sufficient).

The President's Commission also offers an alternative reason for accepting the whole-brain criterion for death. They and other whole-brain advocates claim that the brain is the primary integrating organ. They argue that the brain is the director of the interdependent system that includes itself, the heart, and the lungs, and it is also the director of many other integrative bodily functions that contribute to life (President's Commission 34). The brain is not only responsible for the consciousness of a human being, but it is also the major organizer of all regulatory functions of the body. The brain plays a role in directing the entire organism in a way that is unparalleled by any other organ. While mechanical ventilation may support some regulatory functioning of the organism in the case that the brainstem is non-functional, the President's Commission claims that it is not a complete replacement since technological intervention is not able to regulate complex and integrative homeostatic properties (such as the maintenance of temperature, sleep-wake cycles and biochemical processes) in the way that the brain is able to do. The claim is that the brain is ultimately responsible for the continued successful functioning and integration of all bodily systems (especially those that cannot be sustained with mechanical support), and so, according to the President's Commission, it is the *supreme integrator* of the organism as a whole (responsible for the critical functions, is what Bernat will claim). They argue that the irreversible loss of functioning of the whole-brain causes the irreversible loss of integration (and, Bernat would specify, the capacity to perform critical

functions), and so the whole-brain criterion is a good criterion for the death of the human being (President's Commission 34).

Bernat defends the whole-brain criterion for death, claiming that the cessation of all brain function is required because the functions performed by the individual structures of the whole-brain are responsible for producing the critical functions of the organism as a whole (Bernat 38). Mainly, the higher-brain is responsible for consciousness and the brainstem is responsible for maintaining physiological homeostasis (including sleep-wake cycles, meaning that without the brainstem, the capacity for conscious experience and thought is presumably lost).

Finally, upon settling on the whole-brain criterion for death, the President's Commission puts forth a requirement for a set of clinical tests that may be used to verify that the criterion has been met. The "vital signs" of circulatory and respiratory functions are no longer sufficient to show that the criterion for death has been satisfied in all instances (President's Commission 37). In cases involving mechanical ventilation there must be some other reliable tests to confirm the complete cessation of the functioning of the whole-brain. The President's Commission does not attempt to recommend any specific set of tests, but only emphasizes that these tests determine without doubt that both the higher-brain and the brainstem have permanently ceased functioning, and that these tests be in accordance with accepted medical standards (have passed a test of scrutiny and have been accepted by the medical community).

Whole-brain theorists would allow that public policy recognize the permanent cessation of circulatory and respiratory functions as sufficient for the determination of death in most cases (those cases in which mechanical aid is not artificially sustaining circulation and respiration) (President's Commission 38, Bernat 39). The cessation of heartbeat and breathing for any extended amount of time ensures whole-brain death (because these functions are necessary for

the survival of the brain). Thus, meeting the circulatory-respiratory criterion for death (prolonged cessation of heartbeat and breathing) is sufficient to indicate that whole-brain death has occurred. The President's Commission argues that meeting the circulatory-respiratory criterion is not necessary for determining that the definition of death has been met. In cases of artificially sustained cardio-pulmonary functioning, the circulatory-respiratory criterion for death is not applicable, because this artificial functioning is not indicative of continued integration among the brain, heart and lungs (which, according to the President's Commission, is necessary for life). In cases like this, tests for brain function must be employed to determine that the whole-brain criterion has been met.

An Alternate Approach to Supporting the Whole-Brain Criterion:

Another faction of whole-brain advocates, led by Winston Chiong, want to support the whole-brain criterion not because they believe it to be entirely correct about death (because they don't, they think instead that there can be more than one way to identify the naturally fuzzy concept of death), but because they think it to be best fit for public policy. In his essay "Brain Death without Definitions" (1989), Chiong does not want to commit to an absolute definition of death. His problem with whole-brain death is that some integrative functioning still seems to be possible following the fulfillment of the whole-brain criterion for death. The continuation of functions like hormone secretion and thermoregulation following whole-brain death indicates a problem to Chiong. He argues that, while the whole-brain criterion is the most acceptable criterion for death (and that the irreversible cessation of the functioning of the brainstem may be equally acceptable), the conceptual framework on which the view is based is fundamentally flawed.

Chiong challenges the definition-criterion-tests model, used by both the President's Commission and Bernat, for determining death. Chiong takes issue both with the search to find a single definition of death at all, and with the search to find a single criterion that is both necessary and sufficient in all cases. He claims that the cessation of whole-brain function may not necessarily be a sufficient condition for death. He puts forth the example of the ability of modern medicine to maintain bodies for extended periods of time after they have met the criterion for whole-brain death. This possibility raises questions for him as to whether whole-brain death is truly death, since it seems counter-intuitive to him that a dead body could possibly be sustained for a significant amount of time (instead he says that patients in this state are alive and are afflicted with "chronic brain death").

Chiong, in fact, wants to say that there is no single condition that is necessary for death. He would oppose Bernat's claim that death does not fit with the theory of "fuzzy sets". Instead, it seems to Chiong that there *is* some indeterminacy in the case of death, and we must adhere to a criterion for death that comes closest to capturing all of this variability. He addresses the three most tenable options for the criterion for death, finally settling on the whole-brain criterion as the one that closest satisfies what death seems to be.

He argues that there is something intuitively wrong with the circulatory-respiratory criterion for death. This criterion fails to consider consciousness (the capacity to be awake and responsive), as important evidence for being alive. He thinks it is intuitive to say that a person who has lost heart and lung function but is still aware of himself and is responsive is still alive (which is theoretically possible- Chiong gives an example of a cardiac arrest victim who maintains consciousness for several seconds following arrest). One would say that a patient in this state is dying, but not dead. Chiong thinks that this example also undermines the accepted

definition of death, since an organism that has lost heart and lung function (and isn't getting circulation and respiration by artificial means) should be deemed to have lost integrated functioning, but it seems intuitively wrong to call this organism dead as long as he maintains consciousness.

If consciousness is strong evidence that something is alive, this might push one toward a higher-brain criterion for death, since at least some of the reasoning behind such a criterion is that consciousness is crucial for the life of a human being. Chiong wants to say that this, too, is intuitively wrong. If an organism is not conscious, that does not mean that we necessarily deem that organism to be dead. Counterexamples include those in a permanent vegetative state (PVS). These individuals have no capacity for consciousness, but maintain the classic signs of life such as breathing, sleep-wake cycles, etc. It seems intuitively true that these organisms are alive, yet they have irreversibly lost the capacity for consciousness.

Taken together, these cases demonstrate the varying characteristics of life. According to Chiong, the fundamental idea behind the definition-criterion-tests model, that there is some absolutely necessary characteristic or characteristics for life (the loss of which determines death), is ultimately wrong and unfounded. There are many characteristics that seem necessary for death in different circumstances (in the case of cardiac arrest, the loss of consciousness and in the case of PVS, the loss of spontaneous respiration), but none on its own is always necessary for death to have occurred, and neither is there any characteristic that is always necessary for life.

Chiong wants to say that there is no way to state or even determine some specific essence of death. He thinks that death has no essential characteristic, and so it cannot be defined. In fact, Chiong wants to say that it is not necessary to have a specific unified definition of death in order to successfully talk about and determine death. Instead, Chiong argues that the criteria for the

determination of life and death may be the presence or loss, respectively, of a cluster of characteristics, not one of which is both necessary and sufficient itself for life, but all of which contribute to an organism's continued life in some manner. He offers several examples of such characteristics including consciousness, behavior, integrated and coordinated functioning, capacity to reproduce, and so on. None of these characteristics is necessary in and of itself for something to be alive, but a cluster of these together tend to be mutually supporting and indicative of life, and a lack of such a cluster of characteristics is indicative of death.

Because Chiong's theory of life and death does not have a specific definition, there is some level of indeterminacy. Chiong sees no problem with such indeterminacy, accepting that there will be borderline cases that will pose practical and theoretical problems for determining when death has occurred. To this problem Chiong proposes that our criterion for death be an artificially defined cutoff, similar to that which marks adulthood at 18 years of age. However, there is a disanalogy in the level of acceptable error. It may be acceptable to treat as a "minor" a person who should be considered an "adult" for a short amount of time (in the interest of simplifying laws and regulations), but it is not acceptable to allow a person who should be considered "alive" to be considered "dead."

Chiong claims that the circulatory-respiratory and higher-brain criteria for death are both not acceptable for determining that death has occurred because they do not always agree with the original uncontroversial cases (that is, they are problematic in cases like cardiac arrest and PVS, because they make some obviously living individual count as dead, or vice versa). Instead, Chiong proposes that the whole-brain criterion be accepted as the best artificially sharpened boundary between life and death. He thinks, though, that we do not have to impose a uniform standard in all situations (since the cluster of characteristics necessary and sufficient for death

may vary based on context). There might be some range of admissible criteria for death that any autonomous patient could choose for himself (via what is called a "conscience clause", which would allow a patient choice in what criterion would be applied to him). Chiong's theory would also allow for organ procurement from non-heart-beating donors (NHBDs) since such a process (withdrawal of life support and no attempted resuscitation) ensures that death has occurred or will inevitably occur. Chiong does not want to say that whole-brain death is always necessary and sufficient for death, but he does argue that the whole-brain criterion is the best criterion to use for practical public policy.

Is the whole-brain criterion the right criterion for death? There are challenges made to the whole-brain criterion that claim that it is not sufficient to satisfy the proposed definition of death (that death is the irreversible cessation of the integrated functioning (as evidenced by the critical functions) of the organism as a whole). These objections claim that the death of the whole-brain does not mean that all integrated functioning is irreversibly lost. The whole-brain must be entirely responsible for the organism's integration in order for irreversible loss of functioning of the whole-brain to constitute death. Opponents of the theory want to argue that the whole-brain is really not the supreme integrator in the way that whole-brain theorists like the President's Commission and Bernat make it out to be. The argument is that there are a litany of critical integrating functions that persist even after the whole-brain criterion has been satisfied. The presence of integrating functions (including immune system response and wound healing, and in some cases gestation of a fetus, growth, etc.) independent of brain function indicates that the brain may not be necessary for integration, and so the complete loss of brain function may not be

sufficient to indicate that the definition of death has been satisfied (Shewmon 2001). This argument does not deny that the brain plays a major role in sustaining the integration of the organism as a whole, but it does deny that the brain is the *supreme integrator*. If this objection is right, then the whole-brain works more to enhance integration than to confer integration, and whole-brain theorists are going to need to expand or change their criterion in order for it to satisfy the definition of death.

Could it be that Chiong's cluster theory better captures what death actually is? Where it seems like the President's Commission and Bernat want to do a rigorous investigation into the definition of death, Chiong instead wants to find a criterion that is acceptable for public policy. He is not looking to answer the original question of *When is someone dead?* (the definition of death), but is instead trying to figure out *When is it acceptable to call someone dead?* (what criterion will work best, with regard to both capturing what we mean when we talk about death, and finding the best fit for public policy). He argues that there is no one definition of death since none of the currently proposed options seem to capture what we really mean when we talk about death. This conclusion seems premature, though. It may be difficult to produce the correct definition of death, but that does not mean that one does not exist.

So why is Chiong diverging so far from other prominent theories about death? He appears to be talking past others in the field (he's addressing an entirely different question). By throwing out the need for a definition, Chiong makes room for indeterminacy in the criterion for death (since no specific criterion will necessarily be applicable in all situations according to his cluster theory). This is problematic since most other theorists would contest that life and death are mutually exclusive and collectively exhaustive. When determining whether someone is dead, we're going to want a very high level of certainty. Chiong's theory just doesn't offer that. What

his theory does offer, and what is maybe a motivating factor for his proposal, is the potential for more readily available organs for transplant (especially since it would allow for things like conscience clauses and the context-dependent application of different admissible cutoffs for determining death). What's potentially problematic about Chiong's theory is that it may be an instance in which we are crafting a criterion not because it comes closest to what death is, but because it will produce a desired outcome (more procurable organs)—an ethically questionable motive. If he's right, and there really is no good definition of death, then it may be acceptable to consider these type of utilitarian factors. However, Chiong must produce an incredibly rigorous proof of death being an indeterminate cluster set before we should be willing to choose a criterion based on these types of motivating factors (factors that value a benefit to society over the individual).

Chapter 2: Circulatory-Respiratory Criterion

Another group of bioethicists argue against the use of a brain-based criterion for determining when death has occurred. These theorists agree with the whole-brain theorists on the definition of death as the irreversible cessation of the integrated functioning of the organism as a whole. The *somaticist* argument centers on the idea that the integration of *the organism as a whole* is constituted by the interrelationships among body parts (the *soma*), and cannot be conferred upon the organism by some specific organ (such as the brain). These theorists argue that the circulatory-respiratory criterion for death (the complete and irreversible cessation of circulation and respiration) is the only justifiable criterion, since it ensures the complete loss of somatic integration (the integration of the organism as a whole).

In his article "The Brain and Somatic Integration: Insights Into the Standard Biological Rationale for Equating 'Brain Death' With Death", Alan Shewmon, a leading theorist in the somaticist camp, argues that the brain is not in fact the supreme integrator of the organism as a whole (as is put forth by the President's Commission and accepted by whole-brain theorists like Bernat). Shewmon's idea is that, upon close examination, there is no real reason to posit that the brain has any more integrative function than other vital organs (though it is involved in and contributes to somatic integration), and that what accounts for the integrative unity of the body is not some single part, but rather the vital interactions among body parts.

Shewmon notes the major lack of consensus among bioethicists and other scholars in the field about the nature of death, despite the fact that the whole-brain criterion has been largely accepted as the correct criterion for determining death in public policy (458). Further, there is evidence that suggests that many health care professionals who deal with whole-brain death in practice do not actually think that whole-brain death is really death (459). For example, medical

professionals may say that a patient has suffered brain death, but is being kept alive via life-suppport (a problematic view, since if brain death is to be equated with death, then these patients should no longer be regarded as *alive* following a diagnosis of brain death). Shewmon thinks that this is indicative of a fundamental problem with whole-brain death. He claims that the use of the whole-brain criterion for death was accepted and implemented as public policy before a philosophical proof of its being the best criterion for death was available (458).

In his paper, Shewmon addresses the biological definition of death, which he claims to be based on *somatic integrative unity*, or the *integrated functioning of the organism as a whole* (458). He claims that these are synonymous, that what the President's Commission meant by "organism as a whole" was the unified somatic organism. This definition of death places importance on the integration of the physiological structures and functions of the body, thus distinguishing a bundle of distinct parts from an "organism as a whole". Shewmon argues against proponents of the whole-brain criterion by claiming that it fails to satisfy the accepted definition. He instead proposes that the circulatory-respiratory criterion for death is the best for determining that the definition of death has been met. The circulatory-respiratory criterion states that when circulatory respiratory functions have irreversibly ceased (some time after the arrest of the heart and lungs), the patient's condition has met the definition of death and is dead.

In order to determine what is the best criterion for satisfying the definition of death, Shewmon begins by clarifying what exactly he thinks is meant by *integrative unity*. He proposes seven requirements for integration (459-460):

First, integrative unity should be generic, applicable to every living organism.

Second, our account of integration should reflect the idea that loss of integration is irreversible. Shewmon thinks that our underlying concepts about death require that life is anti-

entropic and death is the point at which entropy will continually increase. He argues that continued integration allows for the anti-entropic capacity of the body, and the loss of such integration is evidenced by the body's giving way to entropy (continued and irreversible breakdown of physical and biochemical processes) (Shewmon 2010, p282). It's possible that Shewmon is wrong about our concepts. It seems at least conceptually possible that integration could be lost and then restored. This seems to be the case when a patient codes (the heart stops beating). At that time, the patient's body is giving way to entropy, until an electrical shock is administered to restart the heart and restore the anti-entropic functioning of the body. This may not be a problem for Shewmon. If he claims that our criterion for death should reflect death's irreversibility, he must just build irreversibility into his definition of death (because the loss of integration is not necessarily irreversible).

Third, the definition of integrative unity should allow us to identify all corpses (that are widely accepted to be corpses) as having lost integrative unity. That is to say, he does not want our definition of integrative unity to identify a clearly dead body as alive. It seems like he is saying that we should account for our shared intuitions about integration—that there appear to be some clear cases in which integration is lost, and that our formulation of integration should be in line with these intuitions.

Fourth, integrative unity must require mutual interaction among the parts of the organism as a whole. Shewmon does not think that organisms are mere collections of things, but are rather a unified system of individual parts. Shewmon means to include specifically those parts that are contributing to the functioning of the "organism as a whole". He thinks it is important to differentiate "organism as a whole" from "whole organism", since the important parts are those that participate in life-sustaining mutual interaction. The "whole organism" is less important,

since not every part of the organism contributes to integration. For example, the pinky toe is part of the "whole organism," but it is not integral to the "organism as a whole," as evidenced by the fact that the loss of such a body part would not lessen the integration of the organism.

Fifth, integrative unity and the lack of integrative unity should be mutually exclusive and definite—a body may either have the property of integrative unity or not, but there should be no in-between. Shewmon argues that "unity" is by definition all-or-none (460), and so integrative unity must either be present or not. He says that this does not preclude his theory from allowing for varying levels of robustness of integration, which might present as variation in the number of integrated systems (474). Is he right that any amount of integration indicates integrative unity? He thinks that the presence of any integration indicates that there is one united thing (since separate things are integrated into one united thing). This may be the case, but then is the integration of ten separate systems the same type of unity as that of just two integrated systems? For Shewmon, it doesn't seem to matter—the presence of even one integrated system means that integrative unity is present.

Sixth, integrative unity should identify all traditionally understood living organisms as alive—we do not want to wrongly identify clearly living organisms as lacking integrative unity, even if they do have profound disability. What Shewmon is getting at here is that there are certain cases in which we feel confident that a human being is alive (because of obvious continued integration). He thinks that we should not ignore our intuitions about clear cases.

Seventh and finally, Shewmon claims that consciousness is not necessary for somatic integrative unity. He claims that it is not contradictory to have a living, integrating organism that has permanently lost the capacity for consciousness.

In view of these requirements for integration, Shewmon proposes a criterion for integrative unity:

> "Integrative unity" is possessed by a putative organism (i.e., it really *is* an organism) *if the latter possesses at least one emergent, holistic-level property*. A property of a composite is defined as "emergent" if it derives from the mutual interaction of the parts, and as "holistic" if it is not predicable of any part or subset of parts but only of the entire composite. (460)

Shewmon argues that integration is indicated by the presence of emergent functions. He shares this notion with Bernat (Bernat 38). Emergent functions are those functions performed by the whole that cannot be performed by any of its component parts (they emerge in virtue of the individual parts working together). According to Shewmon, it is the presence of emergent functions (or even a single emergent function) that indicates that the integration necessary for life is present. He thinks that even one emergent function is indicative of life (for example, consciousness is an emergent function that, when present, would surely mean that the organism is alive even in the absence of any other evidence of integration) (461). Because an emergent function is at the level of the organism as a whole (meaning that an emergent function is a function only performed by the organism as a whole, and not by any one of that organism's constituent parts), Shewmon argues that the presence of one or more emergent functions indicates that there must be a whole upon which the emergent function supervenes. It's possible that Shewmon is wrong about just one emergent function being indicative of life. If life is inherently "anti-entropic," then having just one "holistic-level" property may not be sufficient for having life (if, perhaps, all other emergent properties are giving way to entropy). One might

question whether all emergent properties are equal with regard to sustaining the life of a human being.

Shewmon's clarification of what integrative unity entails allows him to investigate whether or not the definition of death (the irreversible cessation of the integrated functioning of the organism as a whole), so put forth by whole-brain theorists, is fulfilled by human bodies that meet the whole-brain criterion. Shewmon claims that some brain dead bodies retain integrative unity and thus are not dead. One of the standard arguments for brain death is that there are numerous functions (much more than any other organ) performed by the brain that are integrative and necessary for life. Whole-brain theorists argue that the brain is the *supreme integrator* because of the sheer number of important integrating functions that are brain-mediated. They want to say that the total loss of brain function marks the cessation of the functioning of the organism as a whole. Shewmon claims that it does not necessarily follow from the large number of integrating functions of the brain that the loss of these brain functions is equal to the loss of integration. He wants to show that the brain is not necessary for, and actually does much less than whole-brain theorists propose it does to contribute to somatic integration. In order to show that the brain is not entirely responsible for somatic integration, Shewmon argues that: "(1) most brain-mediated integrative functions are actually not *somatically integrating*, and (2) most somatically integrative functions are not, in fact, brain-mediated" (465). He proposes instead that brain-mediated functions work to integrate the brain, and to direct certain bodily functions, but not those functions that are critical to the integration of the organism as a whole (the brain is not responsible for the emergent functions of the body).

In an attempt to show that the brain is not the supreme integrator of the body, Shewmon sets out to show that the supposed myriad of integrating functions performed by the brain (and

used by whole-brain theorists as evidence of the brain's being the supreme integrator) are not actually responsible for providing integration among body parts. Rather, he wants to prove that while the brain may function to enhance and preserve the body's integration, it is not the case that the brain is the major provider of integration among an otherwise nonintegrated assemblage of body parts.

By looking at a few key functions of the brain that are deemed to be somatically integrative by brain death theorists, Shewmon pokes holes in the claim made by whole-brain theorists that the brain is necessary to confer unity and integration upon the body. For example, he discusses the emergent function of breathing. Shewmon claims that breathing is in fact a brain-mediated function, but only in what he calls the "bellows" sense (he means the function of moving air into and out of the lungs) (464). However, Shewmon argues that what is *somatically* integrating about breathing is not the brain-mediated bellows function (which he thinks constitutes brain-body integration but not integration of the organism as a whole). Instead he argues that the function of respiration, by which oxygen is carried throughout the body to all organ systems in order to sustain life, constitutes somatic integration (or integration of the organism as a whole). Further, Shewmon claims that not only is breathing in the bellows sense not a somatically integrative function of the brain, but it's not even a function that is vitally necessary for life. He cites examples of late-stage fetuses in utero and patients on cardiopulmonary bypass, who are alive and somatically integrated in the absence of breathing (in the bellows sense) mediated either by the brain or ventilator. Shewmon claims that this brain-mediated bellows function of breathing is just a condition under which somatic integration can take place (the movement of the lungs is really only bringing air into the body, which allows for the integrative function of respiration to take place), but it is neither conferring somatic

integration, nor necessary for somatic integration to take place (as the whole-brain theorists would claim it is). And, if we look at breathing in the sense of respiration, then the alveolar lining of the lungs, the process of systemic circulation, and the electron transport chain (non- and/or limitedly brain mediated) are responsible for this function, not the actual expansion and contraction of the lungs (464). Perhaps Shewmon is correct to write off lung function as being unnecessary for integration, but he could also be understating the importance of the work the lungs do to move air into and out of the body, because this at least (air intake and expulsion) is necessary for life.

To further support his claim, Shewmon also discusses the somatic function of nutrition, which, when closely examined, works in the same way as breathing with regard to the brain's involvement. His idea is that nutrition understood as simply "eating and drinking", or "swallowing" is in fact brain-mediated, but again, as with breathing, these functions performed by the brain are not actually somatically integrating (465). Shewmon claims that the somatically integrating work is done in this case in the breakdown of food into energy and the building-blocks for cellular activity, functions that the brain has little if anything to do with. Once again, Shewmon is showing that the brain is not responsible for major somatically integrating functions (though it may be responsible for its own integration with the body). His claim is that, because somatic systems like breathing and nutrition do not depend on the brain in order to perform somatically integrating functions, they show that the brain is not the supreme integrator in the way that whole-brain theorists make it out to be.

Shewmon argues further that there is a litany of somatically integrative functions that are not brain-mediated (in addition to respiration and nutrition). In an attempt to refute the argument by whole-brain theorists that the brain is the supreme integrator, Shewmon puts forth many

examples of somatically integrative functions that aren't brain-mediated, and that at least some brain dead patients possess. These include (but are not limited to): homeostasis of interacting chemicals, balance of energy, response of the immune system, healing of wounds, gestation of a fetus, proportional growth, and maintenance of fluid and electrolyte balance. Further, some brain dead patients have been seen to have spontaneous improvement in general health, and the ability to survive a prolonged amount of time with minimal intervention (467). Shewmon claims that these types of non-brain-mediated functions preserve somatic integration without the help of the brain (as it's possible for many of these functions to continue following brain death). Shewmon argues that if there are so many somatically integrating functions that continue to function independent of the brain, then the brain mustn't be critical for somatic integration (and the brain would be critical for somatic integration if it were responsible for the integration of the organism as a whole, as the whole-brain theorists propose) (469).

In another attempt to refute the claim that the brain performs a huge majority of somatically integrating functions, Shewmon puts forth the spinal cord as an example of a system that functions to provide somatic integration. As a major part of the central nervous system, the spinal cord plays a large role in the mediation of somatic integration. Shewmon does not see a reason to draw the line concerning those structures of the central nervous system that are important for integration of the organism as a whole at the base of the brainstem (as whole-brain theorists do) (470). Seemingly integrative functions performed by the spinal cord have been documented following a diagnosis of brain death. For example, the "Lazarus sign" at which time a brain dead patient may rear up from lying down due to residual spinal cord function, or the incidence of prolonged breathing-like movements following brain death, and mediated by the spinal cord. It has been shown that the continued integrity of the spinal cord is related to longer

continued functioning of the body post brain death determination (470). This seems to indicate that the spinal cord has the ability to confer at least some type of somatic integration. This type of integration can be sustained following whole-brain death, which means that the whole-brain criterion does not actually ensure that the definition of death has been met (which is the irreversible cessation of somatic integrative unity). It's possible that the whole-brain theorist could remedy these specific concerns by extending their criterion to include the whole central nervous system (the whole-brain and the spinal cord), but even still, the loss of spinal cord functioning does not necessarily entail the loss of all somatic integration.

Shewmon also takes issue with the diagnostic tests used to determine whole-brain death. He notes that the standard criteria used to diagnose brain death do not require the loss of any brain function deemed by whole-brain theorists to be somatically integrating, which is strange because the standard rationale for accepting brain death as death is the loss of somatic integrative unity (465). Instead, these tests require loss of consciousness, cranial nerve functions, and spontaneous breathing, none of which is vital for somatic integration. Shewmon argues that this is a problem for whole-brain theorists, since the tests for a diagnosis of whole-brain death don't ensure the absence of all somatically integrative functions of the brain (and so fail to confirm that the criterion has actually been met). Of course, if Shewmon is right, the brain doesn't actually perform any somatically integrative functions, and the whole-brain criterion is looking at the wrong biological structures altogether.

Shewmon recognizes the important work that the brain does, but he does not think that the brain is the supreme integrator of somatic functioning. Instead, his claim is that the brain works to modulate and enhance somatically integrating functions. His idea is that the unity of a living organism is not conferred upon it by a single component of the whole, but is instead

determined by the work done by all of the parts that contribute to the higher-level functioning of the whole. Thus, Shewmon argues that the brain is not unity-conferring, but it *is* unity-contributing. He means that the brain is an important part of the whole organism, but it is not itself responsible for somatic integration, and so the loss of whole-brain function (the whole-brain criterion) does not necessarily mean that the definition of death has been met.

Shewmon claims that the property of integration is inherently non-localizable to any one part of the body (472). Numerous parts contribute to the unity of the whole, and because the unity is truly integrative, Shewmon thinks that it does not derive from any single part. He believes he has shown that the brain is not the supreme integrator of the organism as a whole in the way that whole-brain theorists claim it to be. If Shewmon is right, and somatic integration (as is evidenced by the presence of emergent functions) is what is both necessary and sufficient for life, then the criterion for death should not be based on brain function, but should instead be based on how physiological processes work together to maintain the organism as a whole. According to Shewmon, we should look at life as the integration of the body through the coordinated functioning of each of its parts, and death as the moment at which the continued integration of that body has ceased.

Shewmon argues for the circulatory-respiratory criterion for death (the irreversible cessation of circulatory and respiratory functioning) as the best criterion to determine that the definition of death (as the irreversible cessation of somatic integrative unity) has been met. He notes that both circulation and respiration are functions that are means to all of the somatically integrative functions of the body. These two functions, Shewmon claims, are necessary for sustaining life, as is evidenced by the fact that the absence of either necessarily results in the deterioration of all somatically integrative functions (that becomes irreversible, and so meets the

circulatory-respiratory criterion within just tens of minutes) (469). Shewmon wants to make sure that the criterion does not equate circulation with simply heartbeat, nor respiration with lung function. Shewmon notes that heartbeat is not necessary for life, but *circulation* is, and lung function is not necessary for life, but *respiration* is. Circulation and respiration are both non-brain-mediated somatically integrating functions that are necessary for continued somatic integration (thus, life), and Shewmon argues that the loss of these two functions is a more accurate criterion for showing that the definition of death has been met than is any brain-based criterion (469).

Is Shewmon right about the brain doing limited to no somatically integrating work? His argument is that somatically integrating functions occur at the cellular level, and are only supported by brain-mediated functions, but are not brain-mediated themselves. While it is true that what's important about something like breathing is the circulation of oxygen throughout the organism at the cellular level, it could be said that Shewmon is understating the importance of the physical work done by organs like the lungs and heart. The functions at the cellular level cannot and do not sustain the organism without being triggered by events at the level of these major organs—if not for the expanding and contracting of the lungs, and the contracting of the heart, the somatically integrating function of respiration and circulation will not occur (unless there is some artificial support that functions to bring air into and out of the body and to pump blood). These functions of the lungs and heart are directly triggered by the brain (or by machines in the case that the brain is non-functioning).

In addition, the work done at the cellular level isn't always coordinated by the cells themselves. The brain plays a major role, for instance, in directing the metabolism of glucose

based on need and circumstance (Levin 2006). Shewmon seems to think that the brain is only providing the conditions under which somatic integration can take place, but it could be that the brain also plays some role in coordinating somatic integration at the cellular level.

Another possible problem with the somaticist argument is its disregard for the importance of consciousness. It appears that the somaticists are approaching death as purely biological, and are treating human beings as simply organismic life-forms. If this is their intended approach, then it is fine to say that consciousness is not important for life. However, higher-brain theorists (Veatch) and some whole-brain theorists might contest that consciousness is an important critical function that distinguishes human beings from animals (in that it is a characteristic aspect of our existence, or it is necessary for permitting us to interact with and adapt to our environment). These theorists would argue that the somaticists fail to account for this special characteristic of the human being.

There are also practical concerns about the implementation of a circulatory-respiratory criterion. Should it be required that this criterion be met before a diagnosis of death has been made, physicians would face the problem of having to (in some cases) continue administering life supports to patients for whom treatment is widely regarded to be only sustaining a dire biological state with no hope of recovery (for example, patients who meet the whole-brain criterion, who are alive according to the circulatory-respiratory criterion, but in an irreversibly grim state). Doctors might be unable to discontinue treatment unilaterally without the explicit consent of the patient's medical decision-maker, since doing so would be killing the patient. This outcome is unfavorable, because it is impractical to continue treatment for patients who have no hope of recovery (unless we are continuing treatment for a short time to preserve organs for transplant). Further, an acceptance of the circulatory-respiratory criterion would preclude the

removal of many organs for transplant, since organ procurement teams must adhere to the dead donor rule (DDR), which requires that organ donors be dead before organs may be removed (or else the procurement team would be effectually killing the donor). However, this practical concern does not affect the somaticist's proposal for a criterion (rightfully so, since a criterion for death should not be formulated in order for us to procure organs). These concerns must be accepted by somaticists like Shewmon, or else the somaticists could propose that these concerns be remedied through changes to public policy (to allow for physicians to unilaterally cease treatment under certain circumstances at some time before a patient's actual death, and to abandon the DDR).

Chapter 3: Higher-Brain Criterion

The last of the most prominent theories holds that higher-brain death is the death of a human being. Higher-brain death theorists argue that the correct criterion for death is the irreversible cessation of the functioning of the structures of the higher-brain. The argument for this criterion rests on an appeal to the essential nature of the human being. Robert M. Veatch may be the most successful of the higher-brain theorists in arguing for this criterion. This chapter will detail Veatch's argument for the higher-brain criterion and against alternative theories in his paper "The Death of Whole-Brain Death: The Plague of the Disaggregators, Somaticists, and Mentalists" (2005). Veatch's intention with this paper is to address arguments made against the whole-brain approach and for alternate theories of death, as well as arguments made against the higher-brain approach. He argues that other theorists are right to criticize the whole-brain approach, but that they are ultimately wrong about the nature of death. Veatch concludes that his formulation of the higher-brain approach is non-problematic and is the best alternative to the whole-brain criterion.

Veatch first argues against the claim made by the "disaggregators," an alternate theory of death that is not as well-supported as either the whole-brain or circulatory-respiratory theories of death, but which Veatch wishes to dispel nonetheless. These theorists, led by Halevy and Brody (1993), wish to do away with the problem of discovering the "point of death" altogether. The argument is that the moment of death is simply a social construct that exists because of the convergence of what Veatch terms "death behaviors," (358) in reference to those behaviors typically performed in connection with the death of a human being. Death behaviors include any practices that are usually carried out in response to the death of a human being. Examples are: the cessation of life-supporting medical interventions, the procurement of organs for donation,

the reading of the will, the mourning process, the payment of life-insurance, the initiation of a funeral and burial of the body, etc. (358). The disaggregators claim that we can reasonably disaggregate (or perform at different times) those behaviors that are traditionally initiated together at the "point-of-death," indicating that there may not be some definite and singular event that is "death." The idea is that it is reasonable to act in certain ways when a human being has died, but if we may permissibly act in these ways at different times that aren't the "time of death," then there mustn't be a single time at which death actually occurs and makes permissible those behaviors. Instead, the disaggregators claim that death should be viewed as a process, the advancement of which is indicated by the performance of death behaviors (by others) at appropriate times (not necessarily concurrently).

The disaggregators claim that death behaviors associated with a human being's death were reasonably triggered by a single event called "death" when the dying process was rapid and inevitable (before medical interventions like ventilation made possible an extended dying process). However, as medicine has advanced, it has become more and more reasonable to disaggregate these behaviors from one another (meaning that these behaviors ought not always to be performed together at a single time-point). For example, some death behaviors may be carried out before death has been pronounced. For example, we might begin the grieving process before a pronouncement of death (especially if the patient is permanently unconscious). We might also initiate the payout of life-insurance, and even the removal of life-supporting medical intervention in some cases. The idea is that there is no definite moment at which time it is reasonable to treat a human being as dead, and since these death behaviors are not necessarily permissible simultaneously, we can disaggregate them from one another, revealing the death of a human being to occur not at a single time-point, but as a process.

Veatch agrees that many death behaviors should be unbundled (like the examples listed in the previous paragraph, all of which are acceptably initiated in some cases before death). He goes on to argue, though, that the disaggregators' theory of death doesn't get much mileage, since he thinks there will always remain some "core cluster" of death behaviors should necessarily remain aggregated (359). He proposes that the burial of the body and the removal of life-sustaining organs are some of those behaviors that should remain aggregated. Veatch's claim is that this core cluster should remain bundled (and so should be carried out at the same time) because the same rationale will justify the initiation of each—the rationale that the individual has lost the status of being a living human being.

Next Veatch goes on to make an argument for what it is that a living human being has, and a dead human being lacks (the loss of which equals the human being's loss of status as "living"). Veatch's answer changes the terms of the debate. Unlike the whole-brain and circulatory-respiratory theorists, Veatch thinks that what is essential to the life of the human being is non-biological (or at least, not purely biological as the whole-brain theorists and somaticists think it to be). He thinks that a human being is "dead" (having lost his status of being a living human being) when he has lost what Veatch calls "full moral standing" (359). Veatch argues that death is not the loss of the integrated functioning of the organism as a whole as the whole-brain and circulatory-respiratory theorists would argue. With this move, Veatch is redirecting the definition of death debate. His claim here is that when we call a human being "dead," what we are talking about is his moral and legal standing, not necessarily his biological state, meaning that death itself is a moral and legal status, not a biological one. For his definition of death, then, Veatch is looking for that descriptive state of the individual, at which time he has lost "full moral standing," and that justifies us in prescribing the "core cluster."

Veatch claims that our concepts of a living human being (our ideas about our own essential nature) involve some kind of special moral status that gives a human being a right to life (among other rights). He calls this status "full moral standing" and defines it as a status belonging to all full members of the human moral community, which allows each member to claim a set of "human rights" (359). The moment of death, says Veatch, is the time at which a human being loses his "full moral standing" (but retains some lesser moral standing). At the time of this loss, the core cluster of death behaviors may reasonably be initiated.

The core cluster of death behaviors, according to Veatch, are those that are appropriately carried out only when an individual has lost full moral standing. For example, one cannot kill a human being if that human being has lost full moral standing, because no one can take the life of a human being who doesn't have the status of being living. The associated death behavior in the core cluster would be our concluding that some action toward a human organism is not "killing." Additionally, Veatch says that a human being who has lost full moral standing no longer has any claim to constitutional rights, since it does not make sense to provide citizenship status or other constitutional protections to someone who no longer has the status of being a living human being. The death behavior in this case would be our recognition that the human being no longer counts as a citizen of the nation. According to Veatch these are two death behaviors in the core cluster that can only be reasonably initiated at some single and definite time-point—that time at which a human being loses full moral standing. Only when someone loses full moral standing does Veatch think that we may reasonably carry out that core cluster of death behaviors.

Also linked to the loss of full moral standing is the death behavior of organ procurement, by which life-sustaining organs are harvested from the patient in order to be transplanted. Veatch argues that this practice may only be performed upon dead human beings, because otherwise the

process of procurement would kill the patient (which he thinks is certainly morally wrong). Further, he thinks that anyone who wants to call a human being "dead" whenever it is morally warranted to harvest organs is really just identifying the conditions under which a human being has lost "full moral standing" (at which time it is morally warranted to harvest organs) and so is actually dead. Veatch advocates for the continued use of the dead donor rule (DDR), which mandates that organ procurement only take place following a diagnosis of death (in place in order to protect against homicide for the sake of organ removal). He thinks the practice of organ procurement is another in the core cluster of death behaviors that may only reasonably be initiated at the moment of death (360).

Can death behaviors work to help us figure out when someone is dead? According to Veatch, we regularly apply the term "dead" to someone when we think we ought to behave in a certain way toward them (that is, when it is appropriate to begin performing that core cluster of death behaviors). But we might wonder if we think certain actions are appropriate *because* someone is dead, or if we think that someone is dead *because* certain actions are appropriate? It better not be that we are going around in a circle, and the reason we think that someone is dead is because certain behaviors are appropriate, but we think that those behaviors are appropriate because the individual is dead (this circumstance would leave us without a testable definition). This type of reasoning is circular, it doesn't reveal anything about what death is because it assumes the conclusion (that the human being is dead) in the justification for the premise (certain behaviors are appropriate because the human being is dead). To avoid a problem with circularity, Veatch might say that whether someone is dead or not depends on some factual state of affairs, and it is only when a human being is in that state that we think we can reasonably treat him as dead. Veatch doesn't mean the state of the human organism, he means the state of the "someone"

to whom we give moral and legal standing. If this is how he means to argue, Veatch can get around the justification worry, because in this formulation death is not dependent on our behaviors toward an individual, it instead depends on when some descriptive facts about the individual are true.

Veatch is not saying either that the core cluster of death behaviors is appropriate because someone is dead, or that someone is dead because the core cluster of death behaviors is appropriate, but that someone is dead because some specific functions and/or capacities of the individual have been (irreversibly) lost, and the loss of those functions and/or capacities makes certain behaviors permissible. Veatch would then say that we can figure out which functions and/or capacities are relevant to death determination by asking ourselves which of these must be irreversibly absent for it to be morally appropriate to do certain things. That is to say, we can figure out under what conditions someone has lost full moral standing by examining specific instances when we think we are permissibly acting like they have lost that standing. For example, we might ask what it is that someone must be missing for it to be morally appropriate to unilaterally withdraw treatment despite a prior directive by the patient and/or a surrogate's request to continue treatment, or for it to be morally appropriate to harvest critical organs like the heart or liver from a patient who had wished for them to be donated. The core cluster of death behaviors, then, don't determine death, but they do help us to work out what conditions constitute death (because those conditions determine the loss of full moral standing).

Such a method for figuring out when "full moral standing" ends only works for Veatch if he is right about the existence of the core cluster of death behaviors, since he thinks that each behavior is initiated upon the loss of full moral standing. But it appears as if some of those behaviors that Veatch would include in his "core cluster" are not necessarily always aggregated

and carried out upon the loss of full moral standing. That is, death behaviors don't always occur at the same time and for the same reasons. For example, the loss of full moral standing is a necessary condition for the carrying out of a funeral and burial, but it is not always sufficient (e.g. if an autopsy must be carried out first). Also, the loss of full moral standing may be a sufficient but not necessary condition for the withdrawal of treatment (because there may be other cases in which a patient still has full moral standing, but further treatment is certainly futile and may be permissibly withdrawn). It appears as if there may not be a clearly distinguishable core cluster of death behaviors, for which the loss of full moral standing is both necessary and sufficient. If this is the case, Veatch cannot figure out what conditions constitute the loss of full moral standing (since his method involves using the core cluster to determine the conditions under which someone does or does not have full moral standing).

Veatch argues that death and the loss of full moral standing must occur at a single moment, since an individual may either have full moral standing or not (these states are mutually exclusive). He argues that if death is something more like a process, as the disaggregators claim, then we would have to accept the possibility of "partial" death behaviors. For example, if there is not a precise moment of death, then we must apply in-between, indefinite behavior descriptions to certain behaviors, like partial murder/partial corpse mutilation (362), a description that he thinks society would never accept. He claims that the descriptions of certain behaviors toward individuals (those that Veatch puts in the core cluster), either are or are not applicable. For Veatch, it is impossible that death is a process, as evidenced by the fact that the behavior descriptions of certain death behaviors (of those death behaviors in the core cluster, Veatch claims) cannot be applied to in-between cases.

The death behaviors that Veatch has been talking about (regarding the right to not have one's life taken and the right to constitutional protections) reveal that our behaviors surrounding death are moral and political. Veatch claims that the definition of death ought to be about moral and legal status, rather than some biological status (as is put forth by whole-brain theorists and somaticists alike). He thinks that we might use some biological features to determine whether an individual has lost full moral standing, but these biological features are not what is important about when someone is dead (because what is at stake in this debate is when we as a society should treat a human being as dead because the "someone" they were is no longer with us).

Before we can move on to discuss Veatch's definition of death, we must first examine what he means by "full moral standing" (since he doesn't offer a full exposition of "full moral standing" (359)). According to Veatch, "full members of the human moral community" (359) have full moral standing. Veatch may simply mean that full moral standing ought to be afforded to all human beings who have a claim to "human rights" (to being treated with respect for the individual as a human being). But perhaps some basic human rights are not specifically and only afforded to human beings who are *alive*. For example, it is a human right that one's body be treated with respect. This right is not held by only living human beings, as we reasonably require respect of the bodies of the deceased as well. It is also a basic human right that one's expressed wishes for his body and belongings be carried out (i.e. a right to respect for one's autonomy). For example, we require the execution of the will after death out of respect for the individual who once was. It would appear that deceased human beings have a claim to at least some human rights (though, certainly not as many as are afforded to living human beings). If Veatch is saying that those with a claim to human rights have full moral standing, then the loss of full moral

standing does not help us to determine living human beings from dead human beings (since both have a claim to at least some human rights).

In response, Veatch might argue that a human being doesn't actually have a claim to human rights after he is dead. Actually, that a dead person can't make any claims. He could say that the only reason we respect the remains and expressed wishes of the dead is for our own psychological comfort. This means that we honor the dead because we want our bodies and wishes to be honored after our own deaths, and so we institute standards for behavior toward dead human beings according to how we want to be treated after death. This might be a fair objection, but it doesn't help Veatch avoid the problem with equating "full moral standing" with a claim to human rights, since it's unclear how we might tell apart those behaviors that are actually respecting human rights, and those that look like they're respecting human rights (but are really just respecting some standards for how to treat human beings after death) in order to determine when someone has lost full moral standing.

Veatch, then, must mean more by "full moral standing" than a claim to human rights. What does he mean when he talks about individuals being full members of the human moral community (a community characterized by the equal respect of all members' humanity)? He could mean that a human being has full moral standing when he has the capacity for moral *interaction*. This interpretation of full moral standing is problematic though, since some human beings may not have any capacity for acting in the moral world (severely demented or comatose individuals, or infants), but they are nevertheless alive and have full moral standing. Veatch himself insists that these human beings are alive under his view. Maybe Veatch means something more like the capacity to *experience* the human moral community (not requiring the ability to have moral interactions, but just to be affected by the moral considerations of others in

the human moral community). If this is what he means, then the irreversible loss of the capacity to experience the human moral community would constitute the loss of the status of being a full member of the human moral community. The capacity to experience the human moral community is held by the severely demented and infants, and is held by, but might not be accessible to comatose individuals (though it is irreversibly lost by the irreversibly comatose, who have no central nervous system activity).

Veatch claims that human beings who have lost the capacity to experience the human moral community do not have *full* moral standing, but instead have some *lesser* moral standing, which requires us to afford them some human rights (or, if they don't have a claim to human rights, to afford them respect out of consideration for the person who is no longer), and which makes the core cluster of death behaviors permissible.

Setting aside potential problems with "full moral standing," we move on to discuss Veatch's proposed definition of death. To formulate a definition, Veatch must determine what constitutes the loss of full moral standing (and should be called "death"). Veatch argues that the critical feature of the human being (the loss of which makes permissible the carrying out of the core cluster of death behaviors) is not the integrated functioning of the organism as a whole as the whole-brain theorists and somaticists claim, but is actually the integration of the mind and the body. He thinks that it is only when the mind and body are coordinated in such a way as to be constituent parts of a whole that a human being has full moral standing. Veatch claims that, as the critical feature of the human being, the integration of the mind and the body is the feature that gives a human being a place as a full member of the human moral community (in his capacity to experience the human moral community), and so gives him full moral standing. He

proposes that it is with the loss of such integration that a human being loses his full moral standing, and so ought to be declared dead. Veatch's proposed definition of death is: *the irreversible loss of the integration of the mind and body*. Veatch makes his argument for this definition of death in response to the argument made by the somaticists against the whole-brain definition of death.

Somaticists, the most notable being Alan Shewmon (discussed in Chapter 2), argue that what is important about death is the loss of somatic (bodily) integration. In order to undercut whole-brain theorists, the somaticists argue that death, defined as *the irreversible cessation of the integrated functioning of the organism as a whole*, mustn't be determined just based on the irreversible loss of brain function, since other integrative bodily functions (like circulation and respiration) are equally important to somatic integrative functioning. Veatch thinks that the somaticists have concluded correctly that the whole-brain criterion is not the right criterion to satisfy the definition, since a somatic criterion (the circulatory-respiratory criterion) fits better with the definition in that it guarantees that all somatic integration is lost. If these theorists accept the view that the loss of full moral standing is directly correlated with the loss of somatic integration, then they must necessarily conclude that the criterion for the death of a human being should be based on the loss of certain somatically integrating functions (363).

Veatch rejects this position. He thinks that the somaticist argument against the whole-brain criterion for death follows well from the definition accepted by both camps, but that the somaticists and the whole-brain theorists are wrong to accept such a definition. Veatch does not think that what constitutes the loss of full moral standing, and thus death, is the loss of the capacity for somatic integration (364). His idea is that there is something more, something

outside of somatic functioning, that is critical to the life of a human being (and to a person's having full moral standing).

Veatch claims that what ultimately matters for moral standing is not some set of integrated bodily (non-mental) functions. A definition of death that only accounts for bodily functions is in violation of typical Western religious and philosophical thought since it treats human beings as purely biological animals. The whole-brain and somaticist definition of death, says Veatch, may be applicable for scientific discussion of the biological nature of human beings, but it does not encompass all that we Western thinkers believe to be true about ourselves. Veatch suggests that the definition of death must recognize mental function as an essential element of human life.

Veatch believes that the definition of death ought to be formulated with regard to our society's religious or philosophical world-view. Perhaps that is correct, since all of our notions about the nature of death, and all of our death behaviors appear to stem from cultural influence. Even Bernat and Shewmon formulate theories based on what we (from the Western world) accept to be true about the nature of death. Since Veatch thinks that our definition of death ought to be at least somewhat based on our subjective world-views (he is sensitive to the pluralistic nature of our society), Veatch is not opposed to the implementation of a "conscience clause," which would permit people to make their own moral judgments about death (within a reasonable scope) based on their own world-view, should it be different from his proposed criterion (373). Veatch thinks that it would be reasonable to answer the question "When should we call someone dead?" differently if one has different fundamental notions about death (for example, if one came from a background other than the Judeo-Christian/Western tradition on which Veatch bases his argument).

Veatch claims that what we deem to be critical to the life of a human being is directly based on this Western world-view, that our views about the essential nature of the human being are based on Judeo-Christian values and secular analogues. What is critically important to the life of the human being, according to this type of world-view, is not the organism's ability to sustain integrated somatic functions, but is rather *the ability to integrate those somatic functions with the mind*. Veatch argues that it is only when the capacity for this type of integration is present that the minimal requirement for treating a human being as a living human being with full moral standing has been met (365).

Veatch believes that the somaticists have failed to identify the important type of integration for human life. He allows that their definition of death as the irreversible loss of somatic integrative function is applicable for purely biological study of the human being, but claims that what is important in every other facet of study is something more like the integration of body and mind. Veatch argues that the definition of death debate is not purely biological. In fact, he believes that our ideas about death are rooted more in the moral and legal matters concerning death than in matters concerning the functioning of the human organism. Veatch means to say that our definition of death should ultimately be concerned with when a human being has full moral standing and when he loses this standing, since this standing is what is important for the life of a human being according to our world-view. He thinks that any person in the Western world who might be influenced by traditional Judeo-Christian values would insist that the important type of integration for the life of a human being is between the body and the mind (365). Agreement among Judeo-Christian and Western secular beliefs about the importance of this integration indicates that the human being is more than his body.

Defenders of the somaticist view think that all that is essential for the life of a human being is bodily integration, and that there is no need for a human being to have mental functioning to be alive. Veatch argues that the somaticists have made an error in ignoring the importance of mental functioning, which is necessary for a human being to have a capacity for consciousness (the potential for conscious awareness). This capacity for consciousness is widely recognized by Western thinkers to be one of the few characteristic features of a human being. Veatch claims that the capacity for consciousness is important for the human being to function as a whole because such a capacity part of the essential nature of the human being. Veatch believes that the somaticist view of death is wrong because it ignores the importance of the integration of the mind with the body. He thinks that the somaticist view is not giving a full picture of the life of a human being in only looking at the integration of somatic parts (365).

Veatch thinks that, by equating a living human being with a living human body, the somaticists have made a mistake about what is essential to the life of a human being. Veatch claims that the somaticists have confused "me" with "my body" (365), and that what we're really concerned with in the definition of death debate is the "me". We want to know when we as individuals have died, not when our organism has expired. The death of the individual is inextricably linked with the loss of integration of her mind with her body. Without this integration (and thus the capacity for conscious awareness), Veatch thinks that what is essential to the human being is lost, and the human being is no longer *integrated as a whole* (even though somatic integration may continue).

Potentially problematic for Veatch's formulation of death as the loss of integration of the mind with the body is the interesting and rare case of "locked-in" syndrome. Those who have this syndrome are in a state in which they appear to have lost any and all integration of mind and

body. These patients have continued conscious experience, but the mind is unable to function in any integrated way with the body—they require extreme external support in order to maintain physiological functioning (support that is similar to what might be necessary for patients diagnosed with whole-brain death). But it certainly seems like these patients are alive despite such a profound disability because they are consciously aware. It appears, though, that Veatch's definition of death (as the loss of integration of body and mind) is satisfied in this case (and so these patients would be dead on his view). In order for his definition to be acceptable, Veatch mustn't label clearly living human beings as dead. In response, Veatch tries to say that human beings in such a state actually do have mind-body integration. He thinks that the fact that the human being's consciousness (mind) is aware of its existence in a particular body is enough to constitute some level of mind-body integration (375). This response seems to show (very minimal) integration of the mind with the body (just in the mind's awareness that it is embodied), but it is not strong enough to show that the body is integrated with the mind (since the body doesn't appear to have any connection with or influence on the mind).

Do locked-in patients really retain mind-body integration as Veatch tries to say? Maybe not. If they don't, this is a huge problem for Veatch (since his definition of death would deem such obviously living human beings to be dead). Whether or not he's right, and locked-in patients would still be alive on his view, depends on what Veatch means by "integration" and whether or not a mind's awareness of its being embodied counts as such. Veatch claims that, "For [him], and for others in [the Western] tradition, an organism cannot exist as an integrated whole if one of its crucial, essential elements is missing. It is integration of body and mind that is critical" (365). His idea is that the functioning body and the functioning mind are both crucial elements of a living human being, and it is only when these two things are working together that

the human being has the critical type of integration for life. If this formulation of Veatch's view on mind-body integration is correct, then locked-in patients don't have the integration necessary for life. With an apparently non-functioning body, locked-in patients are missing half of what Veatch deems to be important for integration. The mind's awareness of its being *in* a body is not enough for it to be integrated *with* that body. In this case, the body appears to be more of a vessel that the mind is inhabiting than it is an equal part of an integrated whole. Veatch's argument against the counter-example of locked-in syndrome appears to fail because he is wrong about these patients retaining mind-body integration.

Perhaps Veatch could or should put forth that the mind depends on a physical brain (or more specifically, the cerebrum). He might say that so long as there is a mentally functioning brain there is mind-body integration (at least minimally, constituted by just mind-brain integration). In this case it wouldn't matter if a functioning integrated body was attached, and the locked-in patient would be alive on Veatch's view. Any functioning mind without a brain would then be some sort of other-worldly phenomenon (possibly a "spirit"), the existence of which has yet to be proven, and that is not the subject of this debate.

In the next sections of his paper, Veatch defends his formulation of the higher-brain view of death against attacks made by the somaticists. One argument against the higher-brain view is that it involves the loss of personhood as a necessary criterion for death, which would be problematic not only because personhood does not have an agreed-upon definition, but also because the loss of personhood is not a testable criterion. Veatch rejects a personhood formulation of the higher-brain view. He allows that some higher-brain theorists do hold a personhood view (McMahan 2006), but that the main arguments for the higher-brain criterion,

and especially those having to do with consciousness, do not involve personhood at all. Veatch claims that the somaticists have misrepresented the higher-brain view in their criticism of it.

In an effort to combat the "attack on the mentalists" (366), as he refers to this argument, Veatch tries to show that personhood is not necessarily linked with the capacity for consciousness. Veatch is concerned about the various formulations of personhood. He thinks that discussion of personhood cannot have a place in the discussion about death, since the term is quite ambiguous, and problematic in some formulations. Some theorists might argue that personhood applies to just any living human being, even in the absence of consciousness. Some might be more ambitious about notions of personhood, requiring such things as self-awareness, or the capacity to behave in a moral way, which would allow for the existence of at least some living human non-persons (for example, infants may not meet the requirements for being persons, but are still living human beings). Other theorists might fall somewhere in-between. Veatch claims that the capacity for consciousness is not determined by, and does not determine, personhood. To Veatch, personhood should not factor into our discussion about death, since, by at least some formulations of personhood, it is possible for there to be human living non-persons, and so personhood cannot be used as a necessary condition for being alive, nor can its loss be a condition for being dead.

Next, Veatch argues that higher-brain theorists like himself do not place too much emphasis on mental function, a problem proposed by the somaticists. Advocates of the higher-brain view make the capacity for mental function a *necessary* condition for life. However, Veatch wants to show that his opponents make a mistake in charging that the higher-brain view also renders the capacity for mental function a *sufficient* condition for life.

Some who hold the higher-brain view may claim that the capacity for mental function is a sufficient condition for being alive. We might also attribute such a claim to those like the ancient Greeks who believed a human was a soul entrapped in a body. Veatch calls anyone who believes that the human may be reduced to the mind or the soul "mentalist". Veatch does not want to align himself with the mentalist view. He believes that we cannot have a living human being without the involvement of both the mind and the somatic body. Veatch claims that the failure of the somaticists to acknowledge non-mentalist formulations of the higher-brain view renders them unable to use anti-mentalist arguments to adequately argue against his own view.

Next, Veatch addresses another alleged problem proposed by both the somaticists and whole-brain theorists. He thinks this claim against the higher-brain view is unfounded, or at least not problematic for his formulation of higher-brain death. Opponents of the higher-brain criterion make the point that it would have us bury breathing bodies, a practice that would be unsettling at best. This outcome is physiologically possible, since a human being could be declared dead by the higher-brain criterion while the brainstem is still intact and promoting spontaneous respiration. Veatch argues that this physiological phenomenon is not a good reason to reject the higher-brain view. He thinks that the troubling nature of such a state (declared dead but still breathing) is not evidence that these human beings are alive, it only means that there is continued non-conscious functioning of somatic parts.

Veatch argues that for a number of reasons it is not likely that we would actually bury breathing bodies. He points out that we need not necessarily bury every dead body so quickly after a determination of death. For example, we would not bury a viable organ donor, or a body attached to a ventilator. We would first procure the organs and/or remove the machinery. He proposes that we would wait for the cessation of heartbeat and respirations, not in order to

diagnose death (since human beings in this situation are already dead by the higher-brain criterion), but to initiate the burial process, if only for aesthetic and emotional comfort. Veatch maintains that continued respiratory action following higher-brain death in no way shows that these patients are still alive. Just as we currently ignore continued spinal cord reflexes following whole-brain death determination, Veatch proposes that we would ignore continued brainstem functioning (as evidenced by continued breathing) as simply residual brainstem functioning following higher-brain death determination.

Another argument made against higher-brain death is that we are unable to accurately diagnose that the criterion has been met. Veatch doesn't think this is any argument at all against the theoretical soundness of the higher-brain criterion. All this means is that technology must catch up to the criterion. If it's truly the case that it is impossible to determine the death of the higher-brain, then it would be acceptable to make use of another wider criterion (something like the whole-brain criterion) to assure that the higher-brain criterion has been met (and the permanent loss of consciousness has occurred). This would not be an alternative to the higher-brain criterion, but only a way to ensure that it has been met (an extra margin of error to protect against declaring a living human being dead). He proposes that we would use the whole-brain criterion for death determination instead of the higher-brain criterion only until we are able to confidently determine that the higher-brain is completely non-functioning in the case that the brainstem continues to function.

Veatch puts forth his own formulation of the higher-brain view. He does not claim, as the mentalists do, that the only feature is necessary for a human being to have full moral standing is essentially mental (her capacity for consciousness, awareness, self-consciousness, etc.). Instead, Veatch's formulation of the higher-brain criterion claims that what gives a human being full

moral standing (and thus life) is the characteristic of having an "*embodied* capacity for consciousness" (370, italics in original), possibly just through a mind's integration with the brain on which it depends. By this Veatch means that what is important for life is the integration of the mind with the body. Veatch's definition of the death of a human being is the irreversible loss of full moral standing, as evidenced by the irreversible cessation of the integration of the mind and the body. He thinks that somaticists make an error in claiming that it is only the integration of body parts that gives a human being life, and the mentalists make the opposite error by claiming that it is only mental function that is important for life. Veatch believes that his formulation of the higher-brain definition of death as the loss of the capacity for embodied consciousness encompasses both what somatic functions are minimally necessary for life, and what mental functions are minimally necessary for life. He thinks that we can only confer full moral standing upon a human being if he has the capacity for consciousness via the integration of his body with his mind.

Veatch argues that the higher-brain criterion, formulated as the irreversible cessation of all of the critical structures of the higher-brain, is both necessary and sufficient for fulfilling his definition of death (the irreversible loss of the integration of mind and body). Without the functioning of the structures of the higher-brain, Veatch claims that the capacity for embodied consciousness is lost and death has occurred.

There are a few implications for Veatch's theory of death. First, because the functional integration of mind and body is both necessary and sufficient for being a living human being, a functional body without any capacity for consciousness would be dead according to the higher-brain criterion. For example, the PVS patient (if truly permanently vegetative) would count as dead, as would any instance in which the body continues to function (mediated by the brainstem)

while the higher-brain structures have been permanently damaged beyond their ability to function. This implication is normally expected of the higher-brain criterion. Another less obvious implication is that a disembodied mind, functioning outside of the physical human organism, would similarly be determined to be dead. Veatch wants to note that such an instance is completely hypothetical at this point, and so may not be problematic for practical acceptance of the theory. Many mentalist theorists want to claim that a disembodied mind is in fact a living human being, since it would be able to retain consciousness and think in the same way that we embodied minds do. However, Veatch claims that a mind removed from its body would not be the same human being that it was when it was embodied. Perhaps he might say that this entity, if constituted by a brain, is actually "embodied", or that it is something like a "spirit" and though it might be "alive," it is not so in any way that we are concerned with in this debate. His idea is that something essential to the life of that human being has been lost when the mind is no longer integrated with the body, and that while there may be something special about the disembodied mind, it cannot be a living human being as he has defined one (at least, according to a legal and moral definition of death).

Such a conclusion (that a disembodied but functioning mind is not living) appears to be incredibly counter-intuitive. A mind capable of conscious awareness (whether embodied as in the locked-in case, or disembodied) seems to have the type of mental functioning that Veatch and others think to be critical to the life of a human being. He may be right, and such a mind may not retain the same identity as it had when it was embodied, but that doesn't necessarily mean that it does not have full moral standing, since a functioning human mind capable of conscious awareness appears to have a place in the human moral community. The claim that such a scenario is beyond the scope of current technology, and so is not a relevant counter-example is

not a good reason to ignore it. Such a possibility is highly morally relevant, and Veatch must address how conscious awareness is not sufficient for life before his formulation of higher-brain death will be ethically and morally acceptable.

Veatch thinks that his own formulation of the higher-brain view as requiring the loss of integration of body and mind is the most defensible (of all the formulations of death). He agrees with the somaticists that their criterion for death is the best fit for the definition accepted by both the whole-brain theorists and the somaticists (that death is the irreversible cessation of the integrated functioning of the organism as a whole). However, Veatch doesn't think that either camp gets it right. Instead, he proposes a new definition of death as the irreversible cessation of the integration of the mind and the body, on the claim that a human being has lost full moral standing under such circumstances. He thinks that this definition much more accurately represents the moral and legal death of a human being, which he thinks is what we're really concerned about when we debate death. Veatch argues that the best criterion to determine that the definition has been met is the higher-brain criterion: the irreversible cessation of functioning of the structures of the higher-brain, since mind-body integration is surely lost when the higher-brain ceases to function. He warns against mentalist formulations of the higher-brain criterion, which he thinks fail to accurately represent loss of full moral standing. Ultimately, Veatch claims that the integration of the body and mind (in the form of embodied consciousness) is the best definition for the life of a human being, and that the higher-brain criterion is the best criterion for determining that such integration has been lost.

Chapter 4: Organ Procurement and Public Policy

Implications of each criterion for organ procurement:

The practice of organ procurement in the US follows the dead donor rule (DDR), which requires that a patient be declared dead before the removal of any organs (unless a living donor has consented to donate a non-vital organ or a part of an organ, like in the case of kidney or liver donation). The DDR is in place to ensure against the effective killing of the patient by the physician, via the removal of life-sustaining organs. Policy currently recognizes the whole-brain criterion for death, which means that organs may only be procured from patients who have been diagnosed with whole-brain death (or, less often, circulatory-respiratory death). The section to follow details the consequences of implementing each criterion for organ procurement practices and policies, a major factor in the debate for many policy-makers and physicians who hope to make more life-saving organs available for transplant.

Bernat, the leader in the whole-brain camp (discussed in Chapter 1), claims that the whole-brain criterion (the irreversible cessation of functioning of the higher brain and the brainstem) both satisfies the definition of death and allows for the procurement of much-needed organs. It appears as if the whole-brain criterion may make it difficult to procure viable organs, because the tests to ensure whole-brain death may take time, during which otherwise useful organs may begin to deteriorate. In response to this problem, current policy allows for organ donation following five minutes of cardiac arrest (from patients termed "non-heart beating donors"). Originally, Bernat and others raised questions about this practice, because it is at least possible that a patient in arrest for five minutes could be revived and show some brain function, which would mean that they were not yet dead (or they could be revived in purely a circulatory-respiratory fashion, which would mean that this practice is questionable not only from a whole-

brain perspective, but also from a circulatory-respiratory perspective). Bernat is willing to accept that the permanent loss of circulatory and respiratory functions of these patients (while maybe not yet irreversible) is an adequate criterion in some cases to declare death and to harvest organs. He claims that the donor patient, if not already dead following five minutes of cardiac arrest, is still irreversibly dying because he (the patient) will not auto-resuscitate and no one will attempt his resuscitation (because donors of this nature have signed (or a proxy has signed) DNR orders, and so it would not be permissible to disregard those wishes) (41). The outcome of death would be the same whether arrest was observed for five minutes or longer, and Bernat thinks that the "good accruing to the organ recipient, the donor patient, and the donor family resulting from organ donation [justifies] overlooking the biological shortcoming" (41).

Bernat's attempt to reconcile the whole-brain criterion with the high demand for procurable organs appears to be a weak argument. His willingness to allow a diagnosis of death in cases that don't actually fulfill his criterion is motivated by the prospect of making more organs available for procurement. This is not an ethical reason to violate his own criterion, since it is for the benefit of others, and not out of respect for the individual (the patient). Bernat's attempt to both adhere to the DDR and to allow for the procurement of many organs is problematic, since in doing so he must make an exception to his own criterion. This problem indicates an underlying issue either with the whole-brain criterion, or possibly with the DDR, since policy cannot recognize both and still procure much-needed organs. Maybe there are competing values at play and we'll have to compromise somewhere. If we accepted the whole-brain criterion, policy would have to either keep the DDR and allow for death diagnosis even when a patient doesn't truly meet the definition of death (as Bernat would have us do, since he thinks it is permissible to allow "permanent" to stand in for "irreversible" in the criterion in these

cases), or policy would have to abandon the DDR in order to facilitate organ procurement. This would be ethically questionable to many, since the abandonment of the DDR would legalize the killing of patients by physicians to harvest organs. If we don't accept either of these options we will have to accept that there will be a much smaller pool of donor organs.

Perhaps Chiong's resolution to this problem allows for the procurement of much-needed organs while still respecting the DDR (and without violating the criterion). Chiong admits that the criterion for death according to his cluster theory (Chapter 1) may be context-dependent (that is, different conditions will have to be met in different circumstances for a human being to be declared dead). Chiong's cluster theory of death says that there is no one necessary characteristic that makes a human being alive, or the loss of which dead, but that the loss of some number of (life-contributing) characteristics together constitutes death. He thinks that it is permissible to allow for differing criteria for death in differing contexts, provided that these possible criteria represent admissible cutoffs for a death diagnosis (they don't label obviously living human beings as dead, or obviously dead human beings as alive). Chiong supports the implementation of conscience clauses, by which people might indicate the criterion for death that they want to be applied to them (within a range of admissible cutoffs). People who want to donate their organs, for example, might be influenced by such a desire to choose a criterion for themselves that would allow them to become organ donors. The importance of keeping organs healthy for procurement currently allows for organ donation only from patients who meet one of two protocols—they are either dead on the basis of neurological testing (diagnosed whole-brain death), or are "non-heart beating donors" who have discontinued (or a proxy has discontinued) life sustaining treatment in order to produce a hypoxic cardiac arrest (29). After two to five minutes, the organ retrieval process may begin. Bernat faces the problem of violating his own criterion in his support of

organ procurement from non-heart beating donors, but Chiong argues that non-heart beating donors represent another acceptable instance of the context-dependent cutoff for the boundary between life and death. Of course, this resolution only works if Chiong's cluster theory of death is right and thus that there really is no specific and universally applicable criterion for death. There is also the worry that conscience clauses might open up the possibility of physicians or others preying on the ill (pushing patients to adjust their chosen criteria for their own deaths) for the purpose of facilitating organ procurement. Chiong claims that the likelihood of such an outcome is low. Instead, he thinks the option to determine one's own point of death will allow ill patients a higher level of autonomy and control concerning the circumstances of their own deaths.

The somaticists like Shewmon (Chapter 2), who argue for the circulatory-respiratory criterion for death (the irreversible loss of circulatory and respiratory functioning), face an even bigger problem when it comes to organ procurement. Candidates for organ donation must be in a somewhat stable condition for organs to remain viable. That is, there must be ongoing somatic functioning with little pharmaceutical intervention in order to be a candidate for organ donation. The whole-brain criterion makes it possible to procure some viable organs while respecting the DDR, since a patient diagnosed as whole-brain dead may retain some somatic stability for a time. The somaticist, however, would say that the continued somatic integration and functioning of the body (necessarily present for organ procurement to take place) constitutes an emergent function, which indicates that the donor is not actually dead upon procurement according to the circulatory-respiratory criterion. Thus, the practice of organ procurement violates the dead donor rule. Shewmon must either abandon the DDR, or accept that there would be many fewer organs available for procurement should his criterion become public policy for the diagnosis of death.

Higher-brain theorists would argue that an upside to the higher-brain criterion (though maybe not these theorists' motivation in arguing for it) is that, should it be implemented as public policy, many more viable organs would be available for procurement without the need to abandon the DDR. Veatch (Chapter 3) argues that we cannot ethically abandon the dead donor rule, since doing so would legalize the killing of patients for their organs. He thinks that policy must recognize organ procurement as one of those "death behaviors" that is in the core cluster of behaviors that may only reasonably be initiated after the death of the patient (since he thinks it would be morally unreasonable to do so before the patient is dead) (360). According to the higher-brain criterion, even more organs would be available for procurement than are currently available under the whole-brain criterion. This is because doctors would not have to wait for whole-brain death in patients who have already lost all higher-brain activity, during which time donor organs may deteriorate.

Veatch argues that his theory of death will better justify the procurement of organs from anencephalic infants (born without higher-brain structures, and so facing imminent and rapid deterioration) and permanently vegetative patients. The debate about whether or not it is acceptable to procure organs from patients of this nature is ongoing. There is pressure to allow for this practice by those who want to facilitate the procurement of healthy organs. If Veatch is right, and the definition of death is the irreversible loss of mind-body integration, then these patients are dead (according to the higher-brain criterion, the satisfaction of which shows that there has been the irreversible loss of the functioning mind), and so it would be unproblematic to procure organs from them. Other attempts to justify the procurement of these organs fail, Veatch claims, because they are not able to make a compelling argument for an exception to the dead

donor rule. Veatch thinks it is more reasonable to allow for organ procurement from these patients on the grounds that they have lost (or never had) full moral standing, and so are dead.

Further, Veatch claims that anyone who argues that it is acceptable to take life-sustaining organs from an individual has already determined that the individual has lost full moral standing (since, if we think it's okay to procure these vital organs, we think the patient hasn't retained his right to life—if he did still have a right to life he would still have full moral standing and we would not think it acceptable to take his organs). Those who argue for an exception to the DDR for anencephalic infants and PVS patients, as the American Medical Association attempted to do in 1995, have made a conceptual mistake, says Veatch (362). He argues that the case for an exception indicates the belief that the patient has some moral status that permits organ removal. Veatch thinks that those who argue for an exception to the DDR are arguing that these patients do not have full moral standing, and do not have the same claim to a right to life that living patients with the capacity for consciousness have. Veatch's claim is that those who argue for an exception to the DDR are just failing to apply the higher-brain criterion, and patients who some might think warrant an exception (anencephalic and PVS patients) are actually already dead, and so organ procurement may be performed in accordance with the DDR.

The state of current diagnostic and organ procurement policy:

In order to observe the role of the whole-brain criterion for death (currently accepted as policy for death diagnosis) in organ procurement, Youngner et al. conducted a study of the clinical application of the whole-brain death criterion in death determination. In "'Brain Death' and Organ Retrieval: A Cross-sectional Survey of Knowledge and Concepts Among Health

Professionals," a sample of 195 physicians and nurses was interviewed concerning their knowledge, personal concepts, and attitudes about brain death and organ donation.

The study found a general confusion among hospital personnel concerning underlying reasoning for using the whole-brain definition and criterion for death. The confusion often stemmed from a lack of training, as well as a lack of clarity concerning what constitutes the death of severely brain-injured patients. Oftentimes, hospital personnel distinguished "brain death" from "death", which Youngner et al. says "indicates some ambiguity and confusion about [the meaning and implications] of brain death" (2205), since according to the whole-brain criterion, brain death *is* death. Many personnel reasoned that brain dead patients are declared dead because they would die soon anyway, or because they had no quality of life. These reasons for using brain death to declare death imply that a brain dead patient is still alive (though maybe not for long), upon a diagnosis of death. Youngner et al. note that it is incorrect to refer to a patient as having suffered brain death, and then subsequently death, after the removal of cardiorespiratory sustaining equipment. This conception of what's going on in cases of brain death indicates that these patients die in stages, which seems counter to our concepts about death. The whole-brain criterion would say that these patients are truly dead upon the irreversible loss of functioning of the whole brain, with the reasoning that the functions performed by the whole-brain are necessary for life (or the continued integration of the organism as a whole, the definition accepted by whole-brain theorists).

The interviews performed by Youngner et al. indicated confusion among healthcare professionals concerning the underlying concepts that explain the acceptance of the whole-brain criterion for death. The study appears to show that many physicians and nurses hold a concept of death that is not in line with the accepted criterion, and/or the definition that the criterion is based

on. Youngner et al. saw a high prevalence of health care professionals who contradict their own declared thoughts and attitudes about death (58% of respondents did not consistently apply a single coherent concept of death when asked to apply their own concept of death to various hypothetical situations), indicating a general confusion about what death really is (2209).

Current law requires that the dead donor rule (DDR) be met before organ procurement is carried out. The DDR states that organs may only be procured for transplant from dead human beings. Most patients destined to become organ donors are declared dead based on the currently accepted whole-brain death criterion (because whole-brain dead patients on cardiorespiratory support are the best candidates for organ procurement). Youngner et al. think that it is critical that whole-brain death diagnoses be made with confidence in order to satisfy the DDR. They emphasize the importance of having medical professionals (especially those personnel most likely to be involved in the diagnosis and care of brain dead patients) familiarize themselves with the public policy concerning the criterion for death, as well as the underlying conceptual framework behind such policy, in order to correctly and consistently implement it.

Youngner et al. propose that public policy may need to adapt in order to address the extreme need for viable organs for donation. They believe that such changes cannot be made, either morally or practically, before assuring that those effecting such policy (medical professionals) are aware of what the criterion for death is, how best to implement it, and the reasoning behind it (that is, the definition of death and why that definition is accepted, as well as how the criterion helps us to know that the definition has been met). They think that it would be of no use to implement a change that is not understood. If misunderstood, policy might not be well followed (or it might be implemented incorrectly), and might thus contradict the underlying reasoning behind the criterion (in failing to truly satisfy the definition of death) (2210).

The study performed by Youngner et al. illustrates the practical need to adhere to a definition of and criterion for death that is both in line with our underlying concepts about death, and that allows for the procurement of much-needed organs (if at all possible). The study appears to show that the whole-brain criterion doesn't always line up with what we really think that death is (as evidenced by the perception held by many healthcare professionals involved in the diagnosis of death that a human being may go through two deaths: brain death followed by death). These findings indicate that the circulatory-respiratory criterion for death may be more in line with our intuitions about satisfying the definition of death (which by both whole-brain and circulatory-respiratory standards is the irreversible cessation of the integrated functioning of the organism as a whole). However, the circulatory-respiratory criterion for death would be troublesome in application, since physicians must respect the DDR (and so would not be able to procure organs until circulation and respiration permanently cease, after which time many previously viable organs would have deteriorated). If we were to implement the circulatory-respiratory criterion as the accepted criterion for death, we would lose access to many organs for transplant (those organs that would have been acceptably procured according to the whole-brain criterion). Perhaps the only way to both accept a definition of and criterion for death that is in line with what we think death really is, and to allow for the procurement of much-needed organs is to abandon the DDR. If so, there exists the primary task of defining death and finding a criterion that aligns with the definition, as well as the secondary task of determining when it is morally and ethically acceptable to act in some ways toward a human being (like perform organ procurement and unilaterally remove treatment) even before the patient is declared dead. This means that we must approach the definition-criterion-tests model twice. First, we must determine a definition, a criterion and tests for the death of a human being. Second, we must determine a

definition, a criterion and tests for some state or status of the human being that determines when we may reasonably treat a human being in some ways (that have been traditionally associated with death) before he has actually died.

This course of action (the abandonment of the DDR and a move to find an acceptable cutoff for acting in some ways toward a human being) seems to be where the discussion is actually headed. Are the whole-brain, circulatory-respiratory and higher-brain theorists actually talking about the same thing? The next section will discuss the possibility that these camps are talking past each other, with the whole-brain and circulatory-respiratory theorists taking on that primary task of defining biological death and finding a criterion that fulfills that definition, while the higher-brain theorist is taking on the secondary task of determining when we can acceptably treat a human being (an organism with some special characteristics that distinguishes it from other animals) in some ways that might have been traditionally initiated at death.

Which criterion is correct?:

It is important that any investigation into death have the sole goal of discovering when a human being has died. We should not allow any sort of utilitarian goals to influence how we define and determine death. For example, it would be unethical to argue for a criterion for death for the reason that it facilitates the unilateral removal of expensive treatment, or the procurement of organs for transplant, since we view the life of a human being as something that is especially important, something to be preserved and respected in its own right. The end of the life of a human being must be accorded the same type of respect, and so our definition and criterion of death should be formulated with only the goal of respecting the human being. The idea is that we want to figure out what death really is and how to determine that it has occurred, and we don't

want that to be influenced by some other motivations. Some might propose that we should balance our goal of defining and determining human death with our goal of saving the lives of many other human beings, but if we argue for a definition of death for the reason that it balances both of these goals, then we're no longer defining death based on what death really is.

It must be acknowledged that human beings are something especially valuable, not reducible to some assemblage of biological parts. What's essential to the life of a human being? It seems that what we (human beings) value about life is the capacity to act in and/or experience the world, the capacity to make an impact on and/or to be affected by others. As Veatch would say, we value our capacity to be a part of the "human moral community". This feature of human life, which requires capacity for consciousness, might appear to be essential. A human being might say that the loss of any capacity to act in or experience the human moral community would equal the loss of "what makes 'me', 'me'." If we think that the our deaths are just the (irreversible) loss of what we value about life, then Veatch may be on the right track and the higher-brain criterion may be the most applicable criterion for death.

However, what is especially valuable about the life of a human being might not be necessary for that human being (the organism) to be *alive*. How do we regularly use the terms "alive" and "dead?" Shewmon is right to say that the way we apply these terms to human beings is the same way that we apply them to other animals. "Death" is not used to talk about the loss of what one values about living, it is instead used to talk about when some human being (or some animal, lifeform, etc.) is no longer alive. We might talk about the "death of the person" as something having to do with the loss of the feature or set of features that makes a biological human entity a "someone", but that's not the same thing as the "death of the human being." For example, we might say that a persistently unconscious human being is alive, but he isn't "living"

(though he may resume living when and if he regains consciousness). We would think this because we generally take the ability to act in and/or experience the world as necessary to be living (referring to the experience of being alive, not to the state of being alive). But what we're looking for in this debate about the definition of death is the "death of the human being" (when the human being is no longer alive) not the "death of the person" (when the human being is no longer living, as in, having the capacity to experience being alive). Thus, we can only know what it is to be dead by appealing to what it is to be alive.

So, what do we mean when we talk about life? Merriam-Webster dictionary will be a good representation of how we normally use the term. The dictionary definition of "life" is: "an organismic state characterized by capacity for metabolism, growth, reaction to stimuli and reproduction," and the dictionary definition of "death" is "the end of life." These definitions reveal that we normally talk about life as a fundamentally biological phenomenon (a notion that both Bernat and Shewmon agree with). Anything, whether it is an animal, a bacterium, a plant, or some other lifeform, is deemed to be alive if it successfully maintains biological processes to sustain the whole. Thus, the whole-brain theorists and the somaticists are right to agree on the definition of death (the only aspect of the definition-criterion-tests model that these theorists agree about) as *the irreversible loss of the integrated functioning of the organism as a whole*, which emphasizes the biological nature of death, and the importance of somatic integration.

The question, then, is what criterion satisfies this definition of death? The irreversible loss of functioning of the whole-brain as put forth by whole-brain theorists (Chapter 1), or the irreversible loss of circulatory-respiratory functioning as put forth by the somaticists (Chapter 2)? The question centers on what we mean by integration. I think both theorists would agree that integration is the combination and coordination of the parts of the body in such a way that the

parts represent a unified whole. Bernat and Shewmon agree that a human being retains integration as long as any emergent function(s) are present (Shewmon 460, Bernat 38). Emergent functions are those functions that arise as a product of the working of some parts, and which constitute something more than the sum of the working of those component parts. Bernat calls these types of functions "critical functions of the organism as a whole".

Argument from whole-brain theorists like Bernat that the brain is the supreme integrator of the organism as a whole (and thus, is responsible for the emergent functions of the organism) fails in the face of counterexamples put forth by somaticists like Shewmon. He argues that many integrating functions of the brain are not in fact somatically integrating, and further, that most somatically integrative functions are not mediated by the brain. Perhaps the most persuasive part of his argument is the evidence of continued integration following whole-brain death. He puts forth examples of continued homeostasis, energy balance, wound healing, and fetal gestation as only some of the integrative (and emergent) functions that may still be present following diagnosed whole-brain death. This is strong evidence against the claim by whole-brain theorists that the brain is responsible for the integrated functioning of the organism as a whole, since these emergent functions can continue even without the help of the whole-brain. Shewmon successfully shows that the irreversible loss of functioning of the whole-brain (diagnosed whole-brain death) does not necessarily mean that there is the irreversible loss of functioning of the organism as a whole (evidenced by the presence of emergent functions), and so he shows that the whole-brain criterion fails to satisfy the definition of death.

Is Shewmon's circulatory-respiratory criterion both necessary and sufficient for diagnosing death (that is, for ensuring that the definition of death has been met)? Where the whole-brain criterion fails, the circulatory-respiratory criterion (the irreversible loss of

circulatory and respiratory functioning) assures that the loss of all of the integrative functioning of the organism as a whole has occurred. The basis for the somaticist argument is that somatic integration exists diffusely throughout the organism, and is not reducible to some part or set of parts. Shewmon argues that satisfying the circulatory-respiratory criterion is sufficient to fulfill the definition of death. The claim by circulatory-respiratory theorists is that the continued functioning of circulation and respiration is a necessary and sufficient condition for maintaining the integration of the body. The loss of this functioning very surely results in the immediate disintegration, as evidenced by the onset of the rapid deterioration, of the organism as a whole. The somaticists propose, and I think are right in doing so, that circulatory-respiratory functioning is vital to the diffuse, non-localizable integration of the organism, and so the irreversible loss of circulatory-respiratory functioning (a criterion that is met just tens of minutes following the arrest of heartbeat and lung function) is sufficient to determine that integration is lost (and that the definition of death has been met).

Opponents might argue that the somaticist is right to conclude that the whole-brain criterion fails to satisfy the definition of death (in that it doesn't ensure the complete loss of integrated functioning), but that the circulatory-respiratory criterion does not satisfy the definition either. Circulatory-respiratory function must be both necessary and sufficient for the integrated functioning of the organism as a whole, and the loss of circulatory-respiratory functioning must be both necessary and sufficient for the loss of integration in order for the circulatory-respiratory criterion to satisfy the definition of death. What is vital for a human being to be alive will be some biological process that is both necessary and sufficient to sustain the whole. We will be able to tell what that process is by looking at the physiological functioning of the human body. There is no bodily function other than circulatory-respiratory function that is

necessary for the continued functioning of *all* other body systems (the whole-brain theorists think that the brain does this, but the somaticists have already shown that they are wrong to say so, since it is possible for there to be continued integrated functioning for an extended amount of time following the irreversible cessation of the functioning of the whole-brain). Circulatory-respiratory functioning successfully delivers the oxygen that is necessary for energy production to all body tissues, it also serves as a conduit for hormonal and other chemical regulation, and it is a vital component in the immune response. Not only is circulatory-respiratory function necessary for many integrative functions of the human body, but it is also sufficient for integrative function, since at least some integrative functions like energy production and waste removal continue if there is only circulatory-respiratory functioning. It is only when circulation and respiration cease that all integrative functioning of the organism as a whole stops.

For that primary task of defining biological death and finding a criterion that sufficiently fulfills the definition, we can conclude that death is the irreversible loss of the integrated functioning of the organism as a whole, and that the circulatory-respiratory criterion best fulfills the definition (because we have shown it is both necessary and sufficient for determining that the integrated functioning of the organism as a whole has ceased). But this criterion leaves us in a tough place in terms of policy, since it requires that any human being that retains somatic integration via continued circulatory-respiratory functioning is alive (even if that functioning is mediated by extreme mechanical support). Not only would we have to accept that many fewer organs would be available for transplant, but we also have to face the problem of the extreme expense involved in sustaining the lives of severely diminished individuals with no hope of recovery (among whom would be those patients who would be diagnosed as dead according to current policy (the whole-brain criterion)). Perhaps this last one isn't a problem for the

implementation of the circulatory-respiratory criterion, since it is sometimes justifiable to withdraw "futile" treatments if they no longer serve to benefit the patient.

In order to remedy these types of problems, we may need to abandon the dead donor rule, and determine when it might be acceptable to do certain things, like discontinue (futile) treatment and recover organs (with previous permission from the patient and/or his proxy). This type of approach was put forth by Robert D. Truog in his article "Brain Death—Too Flawed to Endure, Too Ingrained to Abandon" (2007). The higher-brain theorists are investigating something like the death of the "someone" or the "me" as opposed to the death of "the organism as a whole," which is what the whole-brain and circulatory-respiratory theorists are investigating. The motivating question for higher-brain theorists is this: what is the essential characteristic of a human being, which elevates him as a subject of our moral considerations above lesser animals and distinguishes him from mere biological functioning, and when is that gone? Veatch would say that the higher-brain criterion actually identifies what death is, but we might argue that he's really identifying when that essential characteristic of the human being is gone, and what's left behind is something fundamentally biological, maybe requiring respect, but not to be held in the same esteem as it once might have been. Veatch argues that this essential characteristic of human life is the integration of body and mind, and it is the loss of such integration that constitutes death. We might think that he's wrong, since we've already concluded that life and death are biological in nature, but we might also think that Veatch has correctly identified this integration as that essential characteristic for the existence of the "someone", the loss of which makes permissible certain actions regarding the human being.

The higher-brain criterion is specifically the irreversible loss of functioning of the higher-brain (the cerebellum and cerebrum), which Veatch thinks determines the complete loss of mind-

body integration. Human beings that meet this criterion exhibit the irreversible loss of the capacity for consciousness, which means that they are unable to act in or experience the world in any way. These individuals are not living (and will never live) in any way that will allow for mind-body integration, since they no longer have any capacity for mental functioning. Veatch argues that the higher-brain criterion correctly identifies the state at which a human being has lost his "full moral standing", and so has lost his right to life. As such, the higher-brain criterion may be applicable as a criterion for when it is acceptable to do certain things to a human being (that may not have been acceptable when the human being retained mind-body integration and so had full moral standing).

In conclusion, death diagnosis must change to reflect that the circulatory-respiratory criterion is the correct necessary and sufficient criterion for meeting the definition of death. In order for this criterion to be usable as public policy, we must also apply the higher-brain criterion as that which identifies when it is acceptable to regard a human being as requiring some lesser moral consideration (when it is okay to do some things that may result in the biological death of the human being through the fulfillment of the circulatory-respiratory criterion). This policy, then, would mean that in some situations a human being's body can be kept alive, but the "someone" that they once were has been lost forever. This two-pronged policy on death will allow us to respect what death really is (as the irreversible loss of somatic integration), while also recognizing that once a human being has lost that essential characteristic of human life that distinguishes the individual from his biological functioning, it may be acceptable (and practical) to proceed with some actions that may result in the hastening of that human being's biological death.

Policy implications:

The implementation of such a policy would be ideal, but there are practical issues that may pose too much of a problem for this type of policy to work out in legal application.

One major problem with the higher-brain criterion is that current technology does not allow us to reliably ascertain that the higher-brain criterion has been met. Evidence of the failure to accurately diagnose higher-brain death was presented by Owen et al. in "Detecting Awareness in the Vegetative State" (2006). The paper compares the fMRI imaging of PVS and non-PVS patients, and shows that some diagnosed PVS patients show neural response to verbal cues by the experimenters. These findings suggest that some patients diagnosed as PVS may actually retain some conscious awareness (and so may not actually be in PVS). If a patient retains any amount of higher-brain function he does not meet the higher-brain criterion. It is important that the diagnosis of higher-brain death be made with certainty, since it would be very bad indeed to treat a patient who has some mind-body integration (and thus who retains his "full moral standing") in the way we may permissibly treat someone who has truly lost this type of integration (and so has lost "full moral standing" and a right to life). Until physicians are able to confidently diagnose higher-brain death, it will be unacceptable to use the higher-brain criterion in order to determine when it is acceptable to do things like remove life-sustaining treatment and procure life-sustaining organs. It may be prudent in this case to establish the whole-brain criterion (for which we have reliable tests) as a safeguard against misdiagnosis, allowing for an extra level of certainty in the fulfillment of the higher-brain criterion (since the death of the whole-brain necessarily includes the death of the higher-brain).

A much larger obstacle for the implementation of a two-pronged policy recognizing the circulatory-respiratory criterion for biological death and the higher-brain criterion for determining when it is acceptable to act in certain ways toward a human being would be public acceptance. The abandonment of the DDR may appear to some as a move toward utilitarian medicine and away from respect for the individual. People may think that physicians would be killing patients for their organs, which on its face appears to be an unethical proposition. While it is true that abandonment of the DDR will effectively legalize the ending of a human being's biological life, such an outcome is not unethical. It is permissible to carry out organ procurement from patients who are higher-brain dead because these patients no longer have that which is essential to the individual (and so, while such a practice would kill the organism, it would not kill the "someone", since that aspect of the human being is already gone in the case of higher-brain death). The abandonment of the DDR would not only be beneficial for the recipient patient, but it would also demonstrate respect for organ donors' wishes (or presumed wishes). Donation is a compassionate choice, made by the donor (or the donor's proxy, who is presumed to know what the donor's wishes would have been) who consented to donation for the benefit of others. Many would appreciate the ability to perform such a benevolent final act of organ donation. If we were to keep the DDR as public policy, we would be denying patients the option to donate (except in the case of living donation of a few non-vital organs or parts of organs), because physicians would have to wait for the irreversible cessation of circulatory-respiratory functioning, by which time most of the patient's organs would have deteriorated beyond repair (and so would not be healthy enough for transplant). To remedy this, we must take organs from live bodies, which is permissible in cases of the irreversible cessation of functioning of the

higher-brain (at which time the "someone" is lost and the human being is a mere biological entity, but still alive nonetheless).

Perhaps more problematic in the eyes of society will be the very idea that we would do certain things that are traditionally associated with a human being's death (like remove treatment and procure organs) from a human being who is not *actually* dead. The argument for such a standard is that it would not only be acceptable, but it would out of respect for the "someone" who used to be, and their loved ones who remain, to discontinue treatment and allow for the biological death of patients who are higher-brain dead (or, in the meantime, whole-brain dead), for whom treatment is widely regarded to be futile, rather than have them continue on in such a diminished and irreversible state. In practice, though, it will be incredibly difficult to get the family and friends of these types of patients to see it this way. If policy were to state that the circulatory-respiratory criterion is the correct criterion for death, then many families would want to fight for the treatment of their loved ones until they are actually dead. Pushback from families would be likely should doctors recommend the discontinuation of treatment on the basis that the patient may be acceptably treated in certain ways (that are usually associated with the patient's death) by the higher-brain criterion. It may appear as if doctors are simply trying to avoid the costs associated with continuing treatment, especially to families of lower socio-economic status who cannot keep up with the cost of treatment themselves. A motivation for using the higher-brain criterion in this way is perhaps in part for the preservation of money and resources, but the practicality of implementation does not affect the permissibility of the criterion. The higher-brain criterion is permissible for use in this way because a patient who meets the criterion has irreversibly lost that essential characteristic that makes him a "someone" with special human rights, not because a patient who meets the criterion is using up a lot of limited resources that

some physicians might think they aren't entitled to. The higher-brain criterion may be ethically implemented barring any abuse by discriminatory physicians (that may be avoided if there are regulatory measures in place for the diagnosis of higher-brain death).

Ultimately, while a 2-step approach to death like the one proposed here is the most ethical and practical, public acceptance of such a policy will not be immediately attained. It will be unsettling for many, and it will require reflection and thought on the part of society and law-makers before we will ever be able to implement it without major push-back. In the meantime, the whole-brain criterion is not totally unacceptable for public policy, because it reliably ascertains that the higher-brain has irreversibly ceased to function and that we may permissibly proceed to act in some ways as if the patient were dead (even though they might not really be dead until the circulatory-respiratory criterion has been met following the cessation of mechanical support). A further reason to use the whole-brain criterion for public policy is that we know that it works in real-world situations, as it has been established in the US without serious obstacles for years now. The whole-brain criterion may not sufficiently satisfy the biological definition of death, but it is an acceptable criterion for acting in some ways toward a human being that will certainly (and quickly) bring about biological death. The implementation of the whole-brain criterion for public policy balances our morally significant considerations, in that it allows us to respect the life of the "someone" while also being a practical option for preserving our limited resources and meeting some of the need for donor organs. It will then be acceptable to continue using the whole-brain criterion for death, because despite its shortcomings it is the most practical and easily accepted option available at this time.

References:

Bernat, James L. "The Whole-Brain Concept of Death Remains Optimum Public Policy." *The Journal of Law, Medicine & Ethics*. Vol. 34, no. 1 (2006): 35-43.

Chiong, Winston. "Brain Death without Definitions." *The Hastings Center Report*. Vol. 35, No. 6 (2005): 20-30.

Halevy, Amir, and Brody, Baruch. "Brain Death: Reconciling Definitions, Criteria, and Tests." *Annals of Internal Medicine*. Vol. 119, No. 6 (1993): 519-525.

Levin, Barry E. "Metabolic sensing neurons and the control of energy homeostasis." *Physiology & Behavior*. Vol. 89, No. 4 (2006): 486-489.

McMahan, Jeff. "An Alternative to Brain Death." *The Journal of Law, Medicine & Ethics*. Vol. 34, No. 1 (2006): 44-48.

Owen, Adrian M., et al. "Detecting Awareness in the Vegetative State." *American Association for the Advancement of Science*. Vol. 313, No. 5792 (2006): 1402.

President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, 1981, *Defining Death: Medical, Legal and Ethical Issues in the Determination of Death*, Washington, DC: Government Printing Office.

Shewmon, Alan D. "The Brain and Somatic Integration: Insights Into the Standard Biological Rationale for Equating "Brain Death" With Death." *Journal of Medicine and Philosophy*. Vol. 26, No. 5 (2001): 457-78.

Truog, Robert D. "Brain Death-Too Flawed to Endure, Too Ingrained to Abandon." *Journal of Law, Medicine & Ethics*. Vol. 35, No. 2 (2007): 273-81.

Veatch, Robert M. "The Death of Whole-Brain Death: The Plague of the Disaggregators, Somaticists, and Mentalists." *Journal of Medicine and Philosophy*. Vol. 30, No. 4 (2005): 353-78.

Youngner, Stuart J., et al. "'Brain Death' and Organ Retrieval: A Cross-sectional Survey of Knowledge and Concepts Among Health Professionals." *The Journal of the American Medical Association*. Vol. 261, No. 15 (1989): 2205-10.